NETAJI SUBHAS OPEN UNIVERSITY

STUDY MATERIAL

B D P

EDUCATION

(EED-II)

PAPER - II

GROUP : A & B

EDUCATIONAL PSYCHOLOGY & PEDAGOGY

PREFACE

In the curricular structure for students of Bachelor Degree Programmes (BDP), framed and followed by the Netaji Subhas Open University (NSOU) in particular and the Open Universities (OUs) - in general, the opportunity to pursue BDP in subjects introduced by this University is equally available to all learners. Instead of being guided by any presumption about ability level, it would perhaps stand to reason if receptivity of a learner is judged in the course of the learning process. That would be entirely in keeping with the objectives of Open and Distance Learning (ODL) mode of education which does not encourage any form of contrived differentiation.

Keeping this -in view, the Self Learning / Instructional Materials (SLMs / SIMs) for **BDP in** Education are being prepared on the scaffolding of mutually cohesive, internally consistent and structured syllabi. Attempts have been made, as per as practicable, to assimilate the best elements in the approved syllabi of Central and State Universities in respective subjects. It has been so designed as to be upgradable and repurposed with the addition of new information as well as results of fresh thinking and analyses with the passage of time.

The accepted methodology of ODL mode has been followed in the preparation of these SLMs, We, owe an enormous debt of gratitude to the experienced scholars whose tireless efforts went into the writing, editing and designing proper lay-out of the SLMs. Practically speaking, their role amounts to an involvement in invisible teaching. For, whoever makes use of these study materials would virtually derive the benefit of learning under their collective care and wisdom without each being seen by the other.

The more learners would seriously pursue these SLMs the easier it will be for him/ her to reach out to the wider horizons of a subject. Care has also been taken to make the language lucid and presentation attractive so that may be rated as quality self-learning materials. If anything remains still esoteric or difficult to follow, arrangements are there to come to terms with them through the Personal Contact / Counseling Programmes (PCPs) made regularly available at the network of Study Centres set up by the University across the State.

Needless to add, a great part of these efforts is still experimental - in fact, pioneering in certain areas. Naturally, there is every possibility of some omission or inadequacy here and there. However, there is scope for amendments and furtherance in due course. It is expected that the present set of SLMs would evoke wider appraisal from its stakeholders in days to come.

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Vice-Chancellor

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Bachelor Degree Programme in Education (EED)

Paper - II : Educational Psychology and Pedagogy

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Educational Psychology and Pedagogy

EED

Paper - II (Group-A&B)

Group - A

Group - B

Unit 1 ❑ Educational Psychology and Pedagogy Structure

Structure

1.1 Introduction

The term 'psychology', literally means the science of the soul. (Psyche—soul; logos =science). Formerly, psychology was a part of metaphysics, and dealt with the nature, origin, and destiny of the soul. It was called rational psychology. But modern psychology is empirical, and does not deal with the problems relating to the soul.

It deals with mental process apart from the soul or mental substance. It is the science of experience and behaviour, which tells us how the mind works and behaves. It can predict the behaviour of an individual, and control it to a certain extent by putting him under proper conditions. It seeks to discover the laws of mind.

Psychology is concerned with the experience and behaviour of the individual. Behaviour is the expression of experience, which belongs to a subject, and which is due to the interaction of subject and object. It implies the duality of subject and object. If there were no subject and object, there would be no experience.

1.2 Objective

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

- Various definitions of Psychology
- Various definitions of Educational Psychology
- Concept of nature and scope of educational psychology
- Concept of Growth and Development of Psychology
- Concept of Jean Piaget's theory

1.3 Concept, Nature and Scope; Distinction between Psychology and Educational Psychology

1.3.1 Concept of Psychology

Earlier psychology was a part of philosophy, which deals with different aspects of soul, but soul cannot be observing nor can we experiment with it. Therefore, this definition cannot be accepted because modern psychology is purely empirical.

In broader aspect, psychology is the study of problems concerning human behavior.

Various definitions of psychology are briefly discussed below :

(i) Psychology is the Science of Mind :

In 1892 William James defined psychology as the 'science of mental processes'. In his view, psychology may be defined in terms of conscious states.

This definition is open to two criticisms. First sciences are of two kinds, viz., natural science and value science. Psychology is a natural science, since it deals with mental processes as they actually happen in the mind. It may be called a behavioural

science. Logic, Ethics, and Aesthetics are value sciences. So the word science is ambiguous. It should be specified as a behavioural science.

Secondly, the word mind is ambiguous. It may mean mental substance, or the mental processes, or the mental substance and mental processes both. Modern psychology deals with mental processes and their expressions in behaviour.

It does not deal with mental substance. Thirdly, the word mind implies a certain unity and continuity which characterize a normal human being. It is wholly lacking in dream states, or in mental derangements, or in animals.

But psychology deals with the mental processes of all minds, human and animal, normal and abnormal. Fourthly, psychology deals also with behaviour, physiological processes and external stimuli and social events connected with mental processes. These are secondary objects of psychological investigation. Hence it is better to define psychology as the science of mental processes.

(ii) Psychology is the Science of Consciousness :

In 1884 James Sully defined psychology as the science of the 'inner world' as distinguished from physical science which study the physical phenomena. In 1892 Wilhelm Wundt defined psychology as the science which studies the 'internal experiences'.

These psychologists gave up the metaphysical concept of mind as a spiritual substance. Some psychologists, particularly the structuralists, defined human mind as the 'sum total of conscious experiences'.

This definition is wrong for the following reasons. First, the word science should be specified as natural or positive. Psychology is a behaviour science, and deals with experience and behaviour of individuals. It is not a value science.

Secondly, psychology deals with different forms of mental processes and behaviour. Hence, the term 'consciousness' is ambiguous.

Thirdly, psychology deals also with behaviour, physiological processes, and external stimuli which are related to consciousness.

(iii) Psychology is the Science of Behaviour :

In 1905 William McDougall (1905) defined psychology as the 'science of behaviour'. In 1911 W. B. Pillsbury also defined psychology as the 'science of behaviour'. Nevertheless, during this period most of the psychologists did not completely overlook the importance of consciousness which accompanies behaviour.

J. B. Watson(1878-1958), however, discarded the concepts of the 'mind',

'consciousness', 'purpose' and the like from psychological use, and defined psychology as 'the science of behaviour'. In his view, psychology as a science studies the response pattern of an individual in reaction to the stimuli coming from the environment.

This definition is defective for the following reasons. First, psychology is a positive science, and should be mentioned definitely. Psychology tells us how we actually behave, and does not tell us like Ethics, how we ought to behave. It tells us how living organisms, human and animal, behave in response to particular stimuli.

Psychology is a positive science. Secondly, psychology is primarily concerned with the study of experience or consciousness. It is concerned with behaviour as its purposive expression. Behaviour is unintelligible without experience. Psychology is the science of experience and purposive behaviour.

The Behaviourists define psychology as the science of behaviour, which is the mechanical response of the organism to a stimulus. Psychology, according to them, does not deal with mind, consciousness, and mental processes. It dispenses with introspection altogether.

It employs the methods of observation and experiment for psychological investigation. It studies the behaviour of the living organisms. The Behaviourists reduce psychology to a branch of biological science.

But this appears to be absurd. Behaviour is inexplicable without experience. Behaviour is not merely a physical phenomenon, and cannot be explained apart from experience. So the Behaviourist psychology which dispenses with mental processes seems to be absurd. Psychology is not a physical science, but a science of mind, which deals with experience and purposive behavior experience being a mental process.

(iv) Psychology is the Science of the Experience and Behaviour of the Individual in Relation to his Environment:

K. Koffka holds that even though the concept of 'consciousness' cannot be completely discarded from psychological vocabulary the main aim of psychology is the study of behaviour.

R. S. Woodworth defines psychology as the **"science of activities of the individual."** In his view, the term 'activity' must be taken in a very broad sense to include organic as well as mental activities. This definition may be taken as partially satisfactory if we understand its implications rightly. However, this definition is open to certain criticisms.

First, psychology is a positive science. Secondly, it deals with experience like perceiving, remembering, imagining, thinking, feeling, emotion, volition, and the

like, and behaviour like reflex action, instinctive action, voluntary action, and habitual action.

Thirdly, the individual is the psycho-physical organism. Psychology deals with experience and purposive behaviour mental processes and their expressions through bodily actions.

Fourthly, the environment acts upon the individual through the sense-organs or receptors, and the individual reacts to the environment through muscles or effectors. Environment includes the physical environment as well as the social environment. Personality of an individual grows through social interaction.

(v) Psychology is the Science of Experience and Behaviour:

Psychology may be defined as the science of experience and purposive behaviour of individuals who process the relevant information from the environment for satisfactory adjustment. The behaviour of an individual is not like that of a machine which is pre-set to react to incoming stimuli.

Behaviour of an individual involves choice of an alternative out of a set of alternatives after he processes the information proceeding from the environment.

It involves decision-making in the choice of an alternative on the basis of previous experience which is stored in memory, and on the basis of anticipated future through understanding of the logical structure of the occurrence of events in nature.

An individual has genetic potentiality for logical thinking which he may further cultivate and develop through learning, and he has the ability for the application of his formalized conceptual framework to the understanding of the environment.

His behaviour is not merely the expression of cumulative past experiences but it is also anticipative in its nature especially because he is capable of abstract thinking, and applying his logical and mathematical strategies for the solution of complex problems.

In brief, behaviour of an individual involves purposiveness, intelligent decision-making, free choice of an alternative out of a multitude, and creative spontaneity. In sum, psychology is the science of experience and telic behaviour of individuals. This standpoint has been taken in this book.

Any other definitions are : -

Woodworth : Psychology is the science of activities of an individual in relation to his environment.

Mc Dougal: Psychology is a science that gives us better understanding and control the behavior of the organism as a whole

Cookes and Stein: Psychology is scientific study of behavior of human and other animals. Crow & Crow: Psychology is the study of human behaviour and human relation

1.3.2 Concept of Educational psychology

Educational psychology is the application of psychological theories and principles into education and its environment. In educational psychology we study the behavior of the individual in the teaching learning process on one hand and help of psychological findings is taken to mold and shape the behavior in a desirable manner on the others. In this process the modification of behavior which meets the ultimate aim of educational psychology.

Definition of Educational Psychology

The following are the definitions of educational psychology by well-known psychologists:

1. " Educational psychology is that branch of psychology which deals with teaching and learning and also covers the entire range and behavior of the personality as related to education." ***Skinner***
2. "While general psychology is pure science, educational psychology is its application in the field of education with the aim of socializing an individual and modifying his behavior." ***Anderson***
3. "It is the systematic study of the educational growth and development of a child." ***Stephen***
4. "It is the science of education." ***E.A. Peel***
5. "It is the study of those facts and principles of psychology which helps to explains and improves the process of education." ***Walter B. Kolesink***
6. ***"Educational Psychology describes and explains the learning experiences of an individual from birth to dearth - Crow & Crow***

Education by all means is an effort to mould and space the behavior of the pupil it aims to bring desirable changes in the child for all round development of his personality.

In brief, educational psychology concerned primarily with understanding the processes of teaching and learning that take place within formal environments and developing ways of improving those methods. It deals with learning theories; teaching methods;motivations;cognitive, emotional moral development and parent child relationship.

1.3.3 Distinction between Psychology and Educational Psychology

The key to the differences between psychology and educational psychology is that educational psychology is one sub-discipline of psychology. Psychology can simply be defined as the scientific study of the human mind and behavior. This is a discipline that encompasses a wide range of sub-disciplines such as abnormal psychology, social psychology, developmental psychology so on and so forth. Educational psychology is also one such sub-discipline which falls under the main discipline of psychology. Educational psychology pays specific attention to the study of learning throughout the human life span. So the main difference between psychology and educational psychology stems from the fact that while psychology in general possesses a broader view which entails all aspects of human life, educational psychology pays specific attention to the learning process.

1.3.4 Nature of Educational psychology.

As an applied science, educational psychology studies human behavior in educational setting for the purpose of increasing rate of learning. It is considering of science as it studies as behavior objectively and prediction are made by it are reliable. It is also considering as art because behavior of individuals is modified and mulded in the direction of pre-determined standard. Its nature is scientific as it has been accepted that it is a Science of Education. We can summarize the nature of Educational Psychology in the following ways:

1. Educational Psychology is a science. Science is a branch of study concerned with observation of facts and establishment of verifiable general laws. Science employs certain objective methods for the collection of data. It has its objectives of understanding, explaining, predicting and control of facts. Like any other science, educational psychology has also developed objective methods of collection of data. It also aims at understanding, predicting and controlling human behaviour.

2. Educational Psychology is a natural science. An educational psychologist conducts his investigations, gathers his data and reaches his conclusions in exactly the same manner as physicist or the biologist.

3. Educational psychology is a social science. Like the sociologist, anthropologist, economist or political scientist, the educational psychologist studies human beings and their sociability.

4. Educational psychology is a positive science. Normative science like Logic or Ethics deals with facts as they ought to be. A positive science deals with facts as they

are or as they operate. Educational psychology studies the child's behaviour as it is, not, as it ought to be. So it is a positive science.

5. Educational psychology is an applied science. It is the application of psychological principles in the field of education. By applying the principles and techniques of psychology, it tries to study the behaviour and experiences of the pupils. As a branch of psychology it is parallel to any other applied psychology. For example, educational psychology draws heavily facts from such areas as developmental psychology, clinical psychology, abnormal psychology and social psychology.

6. Educational psychology is a developing or growing science. It is concerned with new and ever new researches. As research findings accumulate, educational psychologists get better insight into the child's nature and behaviour.

W.A. Kelly (1941) listed the nature of Educational Psychology as follows:

i. To give a knowledge of the nature of the child
ii. To give understanding of the nature, aims and purposes of education
iii. To give understanding of the scientific methods and procedures which have been used in arriving at the facts and principles of educational psychology
iv. To present the principles and techniques of learning and teaching
v. To give training in methods of measuring abilities and achievement in school subjects
vi. To give a knowledge of the growth and development of children
vii. To assist in the better adjustment of children and to help them to prevent maladjustment
viii. To study the educational significance and control of emotions and
ix. To give an understanding of the principles and techniques of correct training.

Thus, educational psychology is an applied, positive, social, specific and practical science. While general science deals with behaviour of the individuals in various spheres, educational psychology studies the behaviour of the individual in educational sphere only.

1.3.5 Scope of Educational Psychology:

Educational psychology embraced over the years' various fields of education e.g. intelligence testing, mental abilities, achievement testing, child psychology, developmental psychology, school performance, mental deficiency, curriculum, personality, character, educational measurement and so on and so forth.

In 1910, the Journal of Educational Psychology was first published, to reveal

experimental researches on various psychological issues regarding education and their interpretations.

In the recent past the field of educational psychology has become more complex as the vision of what it encompasses has broadened. Originally concerned with learning and measurement its scope has been extended with each succeeding generation to the point where now the newest extension is in social-educational field and a new branch emerged in educational psychology known as educational social psychology.

In conclusion, we may note that the aim of educational psychology is to apply psychological concepts and principles in order to improve educational practice. Educational psychology that has evolved as a new discipline tends to represent all the areas within psychology in general.

These include some distinct areas dealing with human development, individual difference in ability, aptitude and temperament, perception, motivation, learning, thinking, problem-solving, psychopathology, the dynamics of personality and group interactional processes.

The educational scientists have employed two strategies for applying psychology in education. Consequently, two kinds of researches had been advanced in the field of educational psychology; the first is the direct experimental investigation of learning in laboratory and school settings.

The second has been an attempt to distil from basic psychological research the educational proceedings to be employed in teaching-learning situation, implication of learning in its broader perspective (formal and informal learning), and also human nature and its interactions.

In this process educational psychology deals not only with the individual's own psychology and its functioning, but also an awareness of his interacting counterpart, the changing environment— both physical and social.

Any educational endeavor is actually a learning situation; the task of educational psychology is to study the learner in that situation. The first learning situation outside the family a child (or a learner) encounters is the school, which is again teaching-learning condition oriented. The teacher's duty in this setting is to apply the general propositions received from psychology and apply them in the classroom.

But not one single strategy employed so far had yielded any fruitful result. A more practical oriented strategy is required in order to synthesize the learner, the teacher the instructional techniques and the educational managers on the one hand and producing qualified students to meet the demand of the day, on the other.

The world we live in today is shaped to a considerable degree by the decisions

people make— individually and collectively. Any decision-making needs possessing some knowledge and use them in solving problems. In other words, the kind of perceiving, thinking and evaluating that goes into the problem solving has to be considered.

Historically, possession of knowledge and its utilization are learned during the developmental years of the children through interacting with parents, employers, religious and political leaders as well as teachers in the classroom.

The interaction with the teachers is no less important in the process of our lifelong learning even if the exposure to school be brief and transitory (this is stated considering the number of dropouts at the school level in our country). It has an impact in their lives, nevertheless.

Specially in the developing countries like India and South Asia the involvement of young people with teachers and schools is certainly increasing as revealed by survey reports at Governmental level for the last two decades. Teachers do play an active role in the teaching-learning system.

It will not be unreasonable to say that the kind of future we and our children will experience is influenced more by teachers than by any other professional groups.

The world of tomorrow will be shaped not only by what today's children are learning from their teachers, but also by the 'way' they are learning it, for it is the way knowledge is presented that determines how children will learn to solve problems. Thus according to Lindgren (1980), the 'how' of teaching includes not only teaching methods, but also teachers' attitudes and values, and full range of teachers' classroom behaviours.

They serve as 'models' whose way of thinking, behaving, attitudes, advice and manner, the process of acquiring and imparting knowledge are imitated in more ways than they can imagine. Hence they are influential far beyond their immediate awareness. Therefore, it is necessary that the teachers know consciously their personal psychology in order to understand the psychology of their students.

1.3.6 Aims and Objectives of Educational Psychology :

Let us start this section with Gordon Allport's caution: "One aim of education is to make available the wisdom of the past and present so that youth will be equipped to solve the problems of future".

The general aims of educational psychology, as stated before, are understanding, predicting and controlling behaviour in learning situations. As the learning situation

includes, teacher, learner, classroom environment and evaluation of their interactions, therefore, each objective can be separately treated.

The aims are closely related with the functional aspects of educational psychology. Hence the functional objectives are:

(1) To evaluate educational theories and put to application the workable part of it;

(2) To examine contemporary educational practices and suggest the modifications required;

(3) To critically examine and evaluate contemporary teaching methodology in the light of established principles of learning and motivation in varying conditions of different cultures, different environments and different facilities provided.

(4) To provide methods for researchers who are scientifically studying educational problems.

(5) To assess and modify the principles and practical operations according to the set values/beliefs and attitude of a culture and also to maintain the scope for the changes with time.

In order to point out the aims of educational psychology it is better to remember William James, who—as early as 1898— put an important question in psychology; "What we are about"? Educational psychology should provide such answer to this question as it is through learning, through experiences a behavioural change occurs and makes a man what he is.

Educators not only look to educational psychology to learn "what we are" about, but also to learn "what we should be about" in education tomorrow—it is not only to 'be' but to 'become'.

But to achieve it, is a hard task. The world is changing so fast that parents and teachers now see that tomorrow is not a photocopy of yesterday, present is not the replica of the past; learning of their time is totally different from that of nowadays.

We need an image of tomorrow's society while teaching today and in framing the aims our image must include the likelihood of radical changes—changes that we are today unable to comprehend.

Because the changes that are likely to occur in possible future is not one-sided, not singular, but plural, many-sided and global. Subject to the choices we would make innumerable arrayed options where some lines of development are more likely than others.

An eye to this will help the educators to frame future sensible goals at present time. The sensible goals signify that the development of personality or constant individual growth must take into consideration the meaning and purpose of human life.

The educationists who set the goals should remember and realize that the homo-sepiens, though primarily animals, are most advanced forms of life. Neither are they to regard people as machines, just a little higher or lower than the computer. "A major task of psychology of the future is to help humans learn how to learn and discover, perhaps to help expand the human potential".

The identification and proper statement of the educational objectives of a lesson is the most important step in instructional planning. When a teacher knows where he is reaching, what is his specific objective, he will be able to decide how he will be designing a lesson. Therefore, getting a clear statement of educational objectives is the first step in the systematic application of psychology to education.

The setting of goals in terms of objectives i.e. to understand, to predict and to control behaviour is the behavioural objectives for the teacher. The first behavioural objective for the teacher is understanding the terms "understanding" and "knowing" and these are the key ones of the various educational objectives.

While setting instructional materials the teacher should analyse the objectives in behavioural terms, like knowing, understanding and recognizing the importance of the materials presented,

Therefore, in setting up educational objectives, the objectives are to be interpreted in such behavioural terms as:

1. Specific statement of properly stated objective.
2. Differentiating between properly stated and improperly stated objectives.
3. Expressing educational goals in terms of behaviourally stated objectives.

The test for whether a person—child or adult—"knows", or "understands" a concept means whether he talks or act appropriately—appropriate to the statement made. In the same way to test whether the person understands a statement made for him, one must witness the fact, watch him talk and act accordingly when confronted with the test situations, or when circumstances arise in the natural course of events.

Therefore, a teacher, when imparting a concept to a student, must check all the aspects of concepts—translate them into behaviour (behavioural concepts) and then test his range of understanding (behavioural objective).

The educational objectives, then, help the educator in deciding what is required to evaluate a person's understanding which is in essence, identifying those tests he wants his students to pass after instruction. Such understanding will also pinpoint the 'skills' and 'knowledge' which are involved in the process of understanding.

Teaching these are the educational goals interpreted as proper form for statements

of educational objectives, whereas instructional objective is to teach a concept or to teach an understanding of a concept.

For example a concept of addition involves many things. "An 'understanding' of addition could be broken down into an understanding of part-whole relationships (Objective I), a 'Knowledge' of the sums and columns of rows and numbers (Objective II), an understanding of word problems involving addition (Objective III) and so on", (ibid) Breaking down the objectives into more specific statements removes some of the vagueness, so that objectives are stated behaviourally, in terms of what student is to say or do - in terms of student's behaviour.

1.4 Growth and Development in Psychology

"Psychology" is defined as "the scientific study of the mind and behavior." In this discipline, it also covers the growth and development of human beings. Humans are very interesting subjects. This includes their growth and development as interesting areas of this topic. "Growth" and "development" always come in pairs. But what are exactly the differences between growth and development in the field of psychology? Let us all find out in this article.

For a quick differentiation about growth and development, psychology defines "growth" as "the physical change that a particular individual undergoes." On the other hand, psychology defines "development" as "the overall growth of humans throughout their lifespan." Development includes the understanding of how and why people change in terms of physical growth, intellectual, emotional, social, and other aspects of human growth. In psychology, there are several principles concerning growth and development. Just by looking at its principles, we can tell the differences between growth and development in psychology.

With regards to development, it always follows a pattern. Development is not a chaotic and immediate process. It takes time, just like growth. For example, the cephalocaudal sequence is a pattern of development. When a baby grows, his activities develop from head to toe. A baby learns how to move his head first before he can walk. Since it follows a pattern, we can say that development is also predictable.

We can say that development is gradual and comprehensive. Like development, growth is not an immediate process. It is a continuous process. The parts of the body continuously grow given the proper nutrition it needs. Until the parts of the body reach their peak of growth, they will continue growing.

The growth rate of humans is not usually uniform. During a human's early years, his growth rate is at its peak. However, during the later years, the growth rate becomes slower. When we will look at the parts of the body, we can also say that each part has a different growth rate. When a baby is born, we can notice that the head seems bigger than the length of the body. The head is actually one-fourth of the body's length in babies.

It is very interesting to watch humans grow and develop. During the development years of humans, development proceeds from general to specific. Let us take a child for example. When a child wants something, he uses his whole hand to point at the thing he wants. But as he grows older, his brain and muscles are developed. With that, he can now use a finger instead of his whole hand when pointing at something. As a child develops, he is being affected by his environment, nutrition, peers, and even his genes. With that, we can say that the development of a child largely depends on his genetic traits and the factors around him.

Growth is more on the physical aspect while development is more on the mental aspect. These two processes are highly correlated with each other. If a child has good physical health, most likely the child also has above average mental capacity. With good physical growth, a child can be more sociable with other people, too.

Developmental Milestones, Ages 2-5 Years

Age (years)	Physical	Personal/Social	Language	Cognitive
2	Kicks a ball; walks up and down stairs	Plays alongside other children; copies adults	Points to objects when named; puts 2-4 words together in a sentence	Sorts shapes and colors; follows 2-step instructions
3	Climbs and runs; pedals tricycle	Takes turns; expresses many emotions; dresses self	Names familiar things; uses pronouns	Plays make believe; works toys with parts (levers, handles)
4	Catches balls; uses scissors	Prefers social play to solo play; knows likes and interests	Knows songs and rhymes by memory	Names colors and numbers; begins writing letters
5	Hops and swings; uses fork and spoon	Distinguishes real from pretend; likes to please friends	Speaks clearly; uses full sentences	Counts to 10 or higher; prints some letters and copies basic shapes

1.4.1 Physical Development

Several physical changes occur during puberty, such as adrenarche and gonadarche, the maturing of the adrenal glands and sex glands, respectively. Also during this time, primary and secondary sexual characteristics develop and mature. Primary sexual characteristics are organs specifically needed for reproduction, like the uterus and ovaries in females and testes in males. Secondary sexual characteristics are physical signs of sexual maturation that do not directly involve sex organs, such as development of breasts and hips in girls, and development of facial hair and a deepened voice in boys. Girls experience menarche, the beginning of menstrual periods, usually around 12-13 years old, and boys experience spermarche, the first ejaculation, around 13-14 years old.

During puberty, both sexes experience a rapid increase in height (i.e., growth spurt). For **girls** this begins between 8 and 13 years old, with adult height reached between 10 and 16 years old. **Boys** begin their growth spurt slightly later, usually between 10 and 16 years old, and reach their adult height between 13 and 17 years old. Both nature (i.e., genes) and nurture (e.g., nutrition, medications, and medical conditions) can influence height.

Because rates of physical development vary so widely among teenagers, puberty can be a source of pride or embarrassment. Early maturing boys tend to be stronger, taller, and more athletic than their later maturing peers. They are usually more popular, confident, and independent, but they are also at a greater risk for substance abuse and early sexual activity (Flannery, Rowe, & Gulley, 1993; Kaltiala-Heino, Rimpela, Rissanen, &Rantanen, 2001). Early maturing girls may be teased or overtly admired, which can cause them to feel self-conscious about their developing bodies. These girls are at a higher risk for depression, substance abuse, and eating disorders (Ge, Conger, & Elder, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Striegel-Moore &Cachelin, 1999). Late blooming boys and girls (i.e., they develop more slowly than their peers) may feel self-conscious about their lack of physical development. Negative feelings are particularly a problem for late maturing boys, who are at a higher risk for depression and conflict with parents (Graber et al., 1997) and more likely to be bullied (Pollack & Shuster, 2000).

The adolescent brain also remains under development. Until puberty, brain cells continue to bloom in the frontal region. Adolescents engage in increased risk-taking behaviors and emotional outbursts possibly because the frontal lobes of their brains are still developing. Recall that this area is responsible for judgment, impulse control, and planning, and it is still maturing into early adulthood (Casey, Tottenham, Liston, & Durston, 2005).

1.4.2. Social Development

Social Development refers to how people develop social and emotional skills across the lifespan, with particular attention to childhood and adolescence. Healthy social development allows us to form positive relationships with family, friends, teachers, and other people in our lives. As we mature, we learn to better manage our own feelings and needs and to respond appropriately to the feelings and needs of others.

Social development can be effected by a child's personality, the opportunities they have for social interaction, behaviors learned from parents, and developmental disorders. For example, a child who has a short temper and who witnesses violence in the home may have trouble learning how to play well with other kids.

German-American psychologist Erik Erikson and his collaborator and wife, Joan Erikson, conceptualized eight stages of psychosocial development that they theorized healthy individuals pass through as they develop from infancy to adulthood. The first stage is called "Trust vs. Mistrust" takes place in infancy. The best virtue for the first stage is hope, in the infant learning who to trust and having hope for a supportive group of people to be there for him/her. The second stage is "Autonomy vs. Shame and Doubt" with the best virtue being will. This takes place in early childhood where the child learns to become more independent by discovering what they are capable of where if the child is overly controlled, they believe to feel inadequate on surviving by themselves, which can lead to low self-esteem and doubt. The third stage is "Initiative vs. Guilt". The basic virtue that would be gained is the purpose and takes place in the play age. This is the stage where the child will be curious and have many interactions with other kids. They will ask many questions as their curiosity grows. If too much guilt is present, the child may have a slower and harder time interacting with other children. The fourth stage is "Industry (competence) vs. Inferiority". The basic virtue for this stage is competency which happens at the school age. This stage is when the child will try to win the approval of others and fit in and understand the value of their accomplishments. The fifth stage is "Identity vs. Role Confusion". The basic virtue gained is fidelity which takes place in adolescence. This is where the child will start to find who he/she is as a person in society. What sex role he/she picks. The sixth stage is "Intimacy vs. Isolation", which happens in young adults and the virtue gained is love. This is where the person will start to share his/her life with someone else intimately and emotionally. In not doing so, it could lead to isolation. The seventh stage is "Generativity vs. Stagnation". This happens in adulthood and the virtue gained would be care. We become stable and start to give back by raising a family and becoming involved in the community. The eighth stage is "Ego Integrity

vs. Despair". This happens during maturity and wisdom is gained. When one grows old and they contemplate and look back and see the success or failure of their life. This is also the stage where one can also have closure and accept death without fearing anything.

1.4.3 Emotional Development

Emotional development comprises the emergence of the experience, expression, understanding, and regulation of emotions from birth and the growth and change in these capacities throughout childhood, adolescence, and adulthood. The development of emotions occurs in transaction with neural, cognitive, and behavioral development and emerges within a particular social and cultural context.

The expression of emotions during infancy promotes the transition from complete dependency toward autonomy. The expression of interest promotes exploration and cognitive development. Social smiles and other expressions of joy promote social interaction and healthy attachment relationships with primary caregivers. The expression of sadness encourages empathy and helping behavior, and the expression of anger signals protest and discomfort. Currently, researchers generally agree that the neonatal smile is present at birth and that the social smile and the emotion expression of interest appear as early as 6 weeks of age. By 4 to 5 months of age. infants selectively smile at familiar faces and infants and their caregivers begin to share positive emotional exchanges.

Apparently consistent with the view that infants' express negative emotions in early infancy, scientists have shown that infants perceive and respond differentially to the negative emotion expressions (e.g., sadness, anger) of others by the age of 4 months.

During the toddler period, in conjunction with rapid maturation of the frontal lobes and the limbic circuit in the brain, recognition of the self emerges. As a result, the toddler strives to become more independent and the expression of anger and defiance increases in this struggle for autonomy. The ability to differentiate the self from others also promotes basic empathic behavior and moral understanding. As children enter preschool, they begin to label their own emotions and rely on discourse about emotions within the family to facilitate their understanding of basic emotions. Young children first distinguish happiness from negative emotions and then begin to distinguish negative emotions such as sadness, anger, and fear from each other. The emergence of emotional self-regulation is particularly important during early childhood and occurs in the context of family and peer relationships. Open expression of positive

emotions and warm, supportive relationships between parent and child promote effective emotional self-regulation. On the other hand, frequent expression of negative emotions in the family and harsh, punitive discipline responses increase the experience of distressing and dysregulated emotions that may lead to psychopathology. Appropriate peer relationships characterized by shared play activities are also important for the development of emotion regulation during early childhood.

During middle and late childhood, stable self-concepts emerge based on the child's typical emotion experiences. With the increased capacity for self-reflection, children gain an understanding of their self-conscious emotions. As a result, the consistent experience of patterns of self-conscious emotions has an impact on the child's self-concept. For example, the tendency to experience shame rather than guilt in response to negative transgressions affects the child's emergent self-esteem and tendency to respond with aggression or violence.

With adolescence comes an additional struggle for autonomy and increased time spent with peers and less time spent with the family. Adolescents become less emotionally dependent on their parents, but this emotional autonomy often emerges after a period of conflict and increased experience of negative emotions. Young adolescents often experience more negative affect than younger children, but the negative affect often decreases during the high school years. However, girls often experience a longer period of elevated negative effect than boys. Adolescents tend to experience more extreme emotions, both negative and positive, than their parents even in response to the same event.

Identity development is important for adolescents as they approach adulthood. When the adolescent or young adult is exploring many identity options, they often have high levels of anxiety but show interest in exploring these options. Adolescents who make an early commitment to a particular identity, usually an identity promoted by their family, have low levels of anxiety and do not experience much conflict in their family relationships. Adolescents who are not exploring identity options tend to have low levels of motivation and often appear bored or apathetic. They have poorer peer relationships and are at greatest risk for mental health problems during adulthood. Finally, young adults who have achieved a stable sense of identity tend to be more empathic and are more successful at managing their emotions.

1.4.4 Cognitive Development

Physical growth, young children also exhibit significant development of their cognitive abilities. Piaget thought that children's ability to understand objects-such as learning

that a rattle makes a noise when shaken-was a cognitive skill that develops slowly as a child matures and interacts with the environment. Today, developmental psychologists think Piaget was incorrect. Researchers have found that even very young children understand objects and how they work long before they have experience with those objects (Baillargeon, 1987; Baillargeon, Li, Gertner, & Wu, 2011). For example, children as young as 3 months old demonstrated knowledge of the properties of objects that they had only viewed and did not have prior experience with them. In one study, 3-month-old infants were shown a truck rolling down a track and behind a screen. The box, which appeared solid but was actually hollow, was placed next to the track. The truck rolled past the box as would be expected. Then the box was placed on the track to block the path of the truck. When the truck was rolled down the track this time, it continued unimpeded.

Just as there are physical milestones that we expect children to reach, there are also cognitive milestones. It is helpful to be aware of these milestones as children gain new abilities to think, problem solve, and communicate. For example, infants shake their head "no" around 6-9 months, and they respond to verbal requests to do things like "wave bye-bye" or "blow a kiss-around 9-12 months. Remember Piagefs ideas about object permanence? We can expect children to grasp the concept that objects continue to exist even when they are not in sight by around 8 months old. Because toddlers (i.e., 12-24 months old) have mastered object permanence, they enjoy games like hide and seek, and they realize that when someone leaves the room they will come back (Loop, 2013). Toddlers also point to pictures in books and look in appropriate places when you ask them to find objects.

Preschool-age children (i.e., 3-5 years old) also make steady progress in cognitive development. Not only can they count, name colors, and tell you their name and age, but they can also make some decisions on their own, such as choosing an outfit to wear. Preschool-age children understand basic time concepts and sequencing (e.g., before and after), and they can predict what will happen next in a story. They also begin to enjoy the use of humor in stories. Because they can think symbolically, they enjoy pretend play and inventing elaborate characters and scenarios. One of the most common examples of their cognitive growth is their blossoming curiosity.

Cognitive skills continue to expand in middle and late childhood (6-11 years old). Thought processes become more logical and organized when dealing with concrete information. Children at this age understand concepts such as the past, present, and future, giving them the ability to plan and work toward goals. Additionally, they can process complex ideas such as addition and subtraction and cause-and-effect

relationships. However, children's attention spans tend to be very limited until they are around 11 years old. After that point, it begins to improve through adulthood.

1.4.5 Language Development

Human infants are acutely attuned to the human voice, and prefer it above all other sounds. In fact, they prefer the higher pitch ranges characteristic of female voices. They are also attentive to the human face, particularly the eyes, which they stare at even more if the face is talking. These preferences are present at birth, and some research indicates that babies even listen to their mother's voice during the last few months of pregnancy. Babies who were read to by their mothers while in the womb showed the ability to pick out her voice from among other female voices.

Since the early 1970s, it has been known that babies can detect very subtle differences between English *phonemes* (the functional units of speech sound). For example, they can detect the difference between "pa" and "ba," or between "da" and "ga." Of course, they do not attach meaning to the differences for 12 months or more. The original technique of investigating this capacity capitalized on babies' innate ability to suck on a nipple. The nipple is linked to a device that delivers sound contingent on the baby's sucking. Babies introduced to this device suck vigorously to hear the sound, even when it is a repetitive "babababa." Because babies also get bored with repetition, they stop sucking hard after a few minutes. At that point the researcher can change the sound in subtle ways, and see if the baby shows renewed interest. For example, it might be a different example of "ba," perhaps one with a bit more breathiness. Or, it could play a sound that would fall into a new phoneme class for adults, like "pa." Babies ignore the first kind of change, just as adults would, but they suck with new vigor for the new phoneme.

Babies have finely tuned perception when it comes to speech sounds, and, more importantly, they seem to classify many sounds the same way adult speakers would, a phenomenon known as *categorical perception* . These sounds that they perceive as indivisible categories are generally those that form the basis for many speech systems in the world's languages, rather than those that are used only rarely, like "th." Infants come into the world already predisposed to make certain distinctions and classifications: apparently they are not driven to make them by language exposure.

1.5 Piaget's Theory of Cognitive Development

Piaget's (1936) theory of cognitive development explains how a child constructs a

mental model of the world. He disagreed with the idea that intelligence was a fixed trait, and regarded cognitive development as a process which occurs due to biological maturation and interaction with the environment.

Piaget was employed at the Binet Institute in the 1920s, where his job was to develop French versions of questions on English intelligence tests. He became intrigued with the reasons children gave for their wrong answers to the questions that required logical thinking. He believed that these incorrect answers revealed important differences between the thinking of adults and children.

.Piaget (1936) was the first psychologist to make a systematic study of cognitive development. His contributions include a stage theory of child cognitive development, detailed observational studies of cognition in children, and a series of simple but ingenious tests to reveal different cognitive abilities.

Piaget's 4 Stages of Cognitive Development

Piaget proposed four stages of cognitive development which reflect the increasing sophistication of children's thought:

1. Sensorimotor stage (birth to age 2)
2. Pre-operational stage (from age 2 to age 7)
3. Concrete operational stage (from age 7 to age 11)
4. Formal operational stage (age 11+ - adolescence and adulthood).

Each child goes through the stages in the same order, and child development is determined by biological maturation and interaction with the environment. Although no stage can be missed out, there are individual differences in the rate at which children progress through stages, and some individuals may never attain the later stages.

Piaget did not claim that a particular stage was reached at a certain age - although descriptions of the stages often include an indication of the age at which the average child would reach each stage.

Sensorimotor Stage (Birth-2 yrs)

The main achievement during this stage is object permanence - knowing that an object still exists, even if it is hidden.

It requires the ability to form a mental representation (i.e., a schema) of the object.

Preoperational Stage (2-7 years)

During this stage, young children can think about things symbolically. This is the ability to make one thing - a word or an object - stand for something other than itself.

Thinking is still egocentric, and the infant has difficulty taking the viewpoint of others.

Concrete Operational Stage (7-11 years)

Piaget considered the concrete stage a major turning point in the child's cognitive development because it marks the beginning of logical or operational thought.

This means the child can work things out internally in their head (rather than physically try things out in the real world).

Children can conserve number (age 6), mass (age 7), and weight (age 9). Conservation is the understanding that something stays the same in quantity even though its appearance changes.

Formal Operational Stage (11 years and over)

The formal operational stage begins at approximately age eleven and lasts into adulthood. During this time, people develop the ability to think about abstract concepts, and logically.

Educational Implications

Piaget (1952) did not explicitly relate his theory to education, although later researchers have explained how features of Piaget's theory can be applied to teaching and learning.

Piaget has been extremely influential in developing educational policy and teaching practice. For example, a review of primary education by the UK government in 1966 was based strongly on Piaget's theory. The result of this review led to the publication of the Plowden report (1967).

Discovery learning - the idea that children learn best through doing and actively exploring - was seen as central to the transformation of the primary school curriculum.

The report's recurring themes are individual learning, flexibility in the curriculum, the centrality of play in children's learning, the use of the environment, learning by discovery and the importance of the evaluation of children's progress - teachers should 'not assume that only what is measurable is valuable.'

Because Piaget's theory is based upon biological maturation and stages, the notion of'readiness' is important. Readiness concerns when certain information or concepts should be taught. According to Piaget's theory children should not be taught certain concepts until they have reached the appropriate stage of cognitive development.

According to Piaget (1958), assimilation and accommodation require an active learner, not a passive one, because problem-solving skills cannot be taught, they must be discovered.

Within the classroom learning should be student-centered and accomplished through

active discovery learning. The role of the teacher is to facilitate learning, rather than direct tuition. Therefore, teachers should encourage the following within the classroom:

- Focus on the process of learning, rather than the end product of it.
- Using active methods that require rediscovering or reconstructing "truths."
- Using collaborative, as well as individual activities (so children can learn from each other).
- Devising situations that present useful problems, and create disequilibrium in the child.
- Evaluate the level of the child's development so suitable tasks can be set.

1.6 Let Us Sum Up

Psychology is the science of behavior and mind, including conscious and unconscious phenomena as well as feeling and thought. It is an academic discipline of immense scope and diverse interests that, when taken together, seek an understanding of the emergent properties of brains, and all the variety of epiphenomena they manifest. As asocial science it aims to understand individuals and groups by establishing general principles and researching specific cases

Educational psychology is the branch of psychology concerned with the scientific study of human learning. The study of learning processes, from both cognitive and behavioral perspectives, allows researchers to understand individual differences in intelligence, cognitive development, affect, motivation, self-regulation, and self-concept, as well as their role in learning. The field of educational psychology relies heavily on quantitative methods, including testing and measurement, to enhance educational activities related to instructional design, classroom management, and assessment, which serve to facilitate learning processes in various educational settings across the lifespan.

Growth is the progressive increase in the size of a child or parts of a child. Development is progressive acquisition of various skills (abilities) such as head support, speaking, learning, expressing the feelings and relating with other people. Growth and development go together but at different rates.Each child's path or pattern of growth and development is determined by genetic and environmental factors. The genetic factors determine the potential and limitations of growth and development. If favourable, the environmental factors, such as adequate nutrition, facilitate the achievement of the genetic potential of growth and development. Unfavourable factors,

acting singly or in combination, slow or stop growth and development. Some of the unfavourable factors are malnutrition, infections, congenital malformations, hormonal disturbances, disability, lack of emotional support, lack of play, and lack of language training. To promote optimum growth, these environmental factors can be removed or minimized. Once they are removed, there follows a period of catch up growth. During this period the growth rate is greater than normal. This growth rate continues until the previous growth pattern is reached. Then the growth rate is reduced to the normal rate determined by the individual's genetic factors. A child genetically determined to be tall grows slightly more rapidly than a child genetically determined to be short. Similarly, a child genetically determined to be clever develops their intellect more rapidly than a child genetically determined to be less intelligent.

Jean Piaget (1896-1980) was one of the most powerful researchers in the area of developmental psychology during the 20th century. He developed the theory of cognitive development. The theory stated that intelligence developed in four different stages. The stages are the sensorimotor stage from birth to 2 years old, the preoperational state from 2 years old to 7 years old, the concrete operational stage from 7 years old to 10 years old, and formal operational stage from 11 years old and up. He also believed that learning was constrained to the child's cognitive development. Piaget influenced educational psychology because he was the first to believe that cognitive development was important and something that should be paid attention to in education. Most of the research on Piagetian theory was carried out by American educational psychologists.

1.7 Unit end Exercise

1. What is psychology?
2. What is Educational Psychology?
3. Write a short note about Nature and of Scope of Educational Psychology.
4. Give definition of Growth and Development.
5. Write a short note of Language Development.
6. Discuss about the distinction between Psychology and Educational Psychology.
7. Describe the Process of Growth and Development.
8. Describe the Stages of Development.
9. Discuss on Piaget's Cognitive Development.
10. What are the differences between Concrnte and Formal Operationl Stages?

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Unit - 2 □ Learning

Structure

2.1 Introduction

Human learning begins before birth and continues until death as a consequence of ongoing interactions between person and environment. The nature and processes involved in learning are studied in many fields, including educational psychology, neuropsychology, experimental psychology, and pedagogy. Research in such fields has led to the identification of various sorts of learning. For example, learning may occur as a result of habituation, or classical conditioning, operant conditioning or as a result of more complex activities such as play, seen only in relatively intelligent animals. Learning may occur consciously or without conscious awareness. Learning that an aversive event can't be avoided nor escaped may result in a condition called learned helplessness. There is evidence for human behavioral learning pre-natally, in which habituation has been observed as early as 32 weeks into gestation, indicating that the central nervous system is sufficiently developed and primed for learning and memory to occur very early on in development.

Play has been approached by several theorists as the first form of learning. Children experiment with the world, learn the rules, and learn to interact through play. Lev Vygotsky agrees that play is pivotal for children's development, since they make meaning of their environment through playing educational games.

2.2 Objectives

Upon completion you will be able to:

- Define, understand and analyse learning, its characteristics and various factors
- Better understand the different theories of learning
- Gain knowledge of transfer of learning, its concept, several types and theories therein
- Acquaint and understand the concept of motivation, its types, factors and its roles in learning

2.3 Definition and characteristics of learning; factors influencing learning

Concept of Learning

The whole educational process is directed for learning. What exists in any educational structure is for learning both for students and teacher. Humans start learning process since their birth to death and various experiences enable them to acquire new skills and information about the surroundings and to plan in the light of previous experiences for the future possibilities.

So experiences, a person encounters, give feedback to him or her. The feedback that is taken through experience is term learning, in common language.

Meaning and Definitions of learning

Learning, in psychology, is the process by which a relatively lasting change in potential behaviour occurs because of practice or experience. Learning is also a process of acquiring modifications in existing knowledge, skills, habits, or tendencies through experience, practice, or exercise.

Gates and others —Learning is the modification of behaviour through experience

Henry, P Smith —Learning is the acquisition of new behaviour or strengthening or weakening of old behaviour as a result of experience.

Crow and Crow —Learning is the acquisition of habits, knowledge and attitudes. It involves new ways of doing things, and it operates in an individual 's attempt to overcome obstacles or to adjust to new situations.

Skinner —Learning is the process of progressive behaviour adaptation.

Munn —To learn is to modify behaviour and experience. I

M. L. Bigge—Learning may be considered as change in insights, behaviour, perception, motivation or a combination of these.

The above definitions emphasize four attributes of learning

1. As Process: the first is that learning is permanent change in behaviour.
2. It does not include change due to illness, fatigue, maturation and use of intoxicant.
3. The learning is not directly observable but manifests in the activities of the individual.
4. Learning depends on practice and experience.

Hence, it may be said that learning is the process of acquiring new or modifying existing knowledge, behaviours, skills, values, or preferences. The ability to learn is possessed by humans, animals, and even some machines, and there is also evidence for some kind of learning in some plants. Some learning is immediate, induced by a single event (e.g. being burned by a hot stove), but much skill and knowledge accumulates from repeated experiences. The changes induced by learning often last a lifetime, and it is hard to distinguish learned material that seems to be "lost" from that which cannot be retrieved.

Nature of Learning:

- **Learning is adaptation or adjustment:** All persons continuously interact with their environment. We often make adjustment and adapt to our social environment. Through a process of continuous learning, the individual prepares himself for necessary adjustment or adaptation. That is why learning is also described as a process of progressive adjustment to ever changing conditions, which one encounters.
- **Learning is improvement:** Learning is often considered as a process of improvement with practice or training. We learn many things, which help us to improve our performance.
- **Learning is organizing experience:** Learning is not mere addition of knowledge. It is the reorganization of experience
- **Learning brings behavioural changes:** Whatever the direction of the changes may be, learning brings progressive changes in the behaviour of an individual. That is why he is able to adjust to changing situations
- **Learning is active:** Learning does not take place without a purpose and self-activity. In any teaching learning process, the activity of the learner counts more than the activity of a teacher.
- **Learning is goal directed:** When the aim and purpose of learning is clear, an

individual learns immediately. It is the purpose or goal, which determines what, the learner sees in the learning situations and how he acts. If there is no purpose or goal, learning can hardly be seen.

- **Learning is universal and continuous:** All living creatures learn. Every moment the individual engages himself to learn more and more. Right from the birth of a child till the death, learning continues.

Characteristics of Learning

Following are the characteristics of learning in general:

1. It is the change with or acquired or adjustment of behaviour.
2. It is doing and practice.
3. It is continuous process till death.
4. It is goal directed i.e. to fulfil some basic needs.
5. It is continuous reconstruction i.e. replacing the old with the new experiences.
6. It outcome may or may not be positive.
7. It is the product of activity.
8. It helps in proper growth and development.
9. It is universal irrespective of colour, creed, language etc.

Factors influencing learning : There are various facets that influence learning. Some of them are listed below;

External factors

1. **Heredity:** A classroom instructor can neither change nor increase heredity, but the student can use and develop it. Some learners are rich in hereditary endowment while others are poor. Each student is unique and has different abilities. The native intelligence is different in individuals. Heredity governs or conditions our ability to learn and the rate of learning.
2. **Status of students:** Physical and home conditions also matter: Certain problems like malnutrition i.e.; inadequate supply of nutrients to the body, fatigue i.e.; tiredness, bodily weakness, and bad health are great obstructers in learning. These are some of the physical conditions by which a student can get affected. Home is a place where a family lives. If the home conditions are not proper, the student is affected seriously. Some of the home conditions are bad ventilation, unhygienic living, bad light, etc. These affect the student and his or her rate of learning.

3. **Physical environment:** The design, quality, and setting of a learning space, such as a school or classroom, is critical to the success of a learning environment. Size, configuration, fresh air, temperature, light, acoustics, furniture, all these can affect a student's learning. The tools and teaching aids used by both instructors and students directly affect how information is conveyed, from display and writing surfaces (blackboards, markerboards, tack surfaces) to digital technologies. Aesthetics can also play a role, for if student morale suffers, so does motivation to attend school.

Internal factors

There are several internal factors that affect learning. They are:

1. **Goals or purposes :** A goal should be set to each pupil according to the standard expected to him. A goal is an aim or desired result. There are 2 types of goals called immediate and distant goals. A goal that occurs or is done at once is called an *immediate goal,* and *distant goals* are those that take time to achieve. Immediate goals should be set before the young learner and distant goals for older learners. Goals should be specific and clear, so that learners understand.
2. **Motivational behaviour :** Motivation means to provide with a motive. Motivation learners should be motivated so that they stimulate themselves with interest. This behaviour arouses and regulates the student's internal energies.
3. **Interest :** This is a quality that arouses a feeling. It encourages a student to move over tasks further. During teaching, the instructor must raise interests among students for the best learning. Interest is an apparent (clearly seen or understood) behaviour.
4. **Attention :** Attention means consideration. It is concentration or focusing of consciousness upon one object or an idea. If effective learning should take place attention is essential. Instructors must secure the attention of the student.
5. **Drill or practice :** This method includes repeating the tasks many times like needs, phrases, principles, etc. This makes learning more effective.
6. **Fatigue :** Generally, there are three types of fatigue, i.e., muscular, sensory, and mental. Muscular and sensory fatigues are bodily fatigue. Mental fatigue is in the central nervous system. The remedy is to change teaching methods, e.g., use audio-visual aids, etc,

7. **Aptitude :** Aptitude is natural ability. It is a condition in which an individual's ability to acquire certain skills, knowledge through training.
8. **Attitude :** It is a way of thinking. The attitude of the student must be tested to find out how much inclination he or she has for learning a subject or topic.
9. **Emotional conditions :** Emotions are physiological states of being. Students who answer a question properly or give good results should be praised. This encouragement increases their ability and helps them produce better results. Certain attitudes, such as always finding fault in a student's answer or provoking or embarrassing the student in front of a class are counterproductive.
10. **Speed, Accuracy and retention :** Speed is the rapidity of movement. Retention is the act of retaining. These 3 elements depend upon aptitude, attitude, interest, attention and motivation of the students.
11. **Learning activities :** Learning depends upon the activities and experiences provided by the teacher, his concept of discipline, methods of teaching and above all his overall personality.
12. **Testing :** Various tests measure individual learner differences at the heart of effective learning. Testing helps eliminate subjective elements of measuring pupil differences and performances.
13. **Guidance :** Everyone needs guidance in some part or some time in life. Some need it constantly and some very rarely depending on the student's conditions. Small learners need more guidance. Guidance is an advice to solve a problem. Guidance involves the art of helping boys and girls in various aspects of academics, improving vocational aspects like choosing careers and recreational aspects like choosing hobbies. Guidance covers the whole gamut of learner's problems- learning as well as non- learning.

Besides the above two factors, there are other important areas that affect/influence learning: These are:

1. Factors Associated with Learner and
2. Factors Related to Learning Process

I. Factors associated with learner:

Learner is the focal point in any learning. Without learner there cannot be learning. **The following are some of the factors associated with the learner:**

1. Motivation:

It is the most important factor influencing the learner. If the learner has no motivation

to learn, any amount of force will be futile. More the motivation better will be the learning. In addition to motivation, the learner should have a definite goal. It will direct the individual appropriately and help him to achieve the goal.

2. Readiness and will power:

This is just like motivation. If the learner is ready to learn, he will develop motivation to learn. Along with readiness a strong willpower is also essential to overcome hurdles and problems. Readiness will help to develop a positive attitude in learner.

3. Ability of the learner:

This refers to the level of intelligence, creativity, aptitude and such other abilities necessary for learning.

Intelligence enables the learner to learn better and understand things and relationship between them. It includes both general and specific intelligence related to specific area of learning.

4. Level of aspiration and achievement:

Learning depends upon the level of aspiration to achieve. If the aspiration level is high, the learner will work hard and achieve more. However, the aspiration level should be in accordance with the ability of the learner.

Otherwise, it may affect negatively leading to feelings of inferiority. At times the learner may not realize his ability and keep low level of aspiration resulting in low achievement, which is also a tendency to be rectified.

5. Attention:

Learner must learn to concentrate his attention on learning. Attentiveness helps to grasp learning material. Distraction of attention affects learning,

6. General health condition of the learner:

The general health includes the physical and mental health of the learner. The learner should have good physical health. Organic defects like blindness, myopia, hypermetropia, deafness, paralysis, mutism, severe handicappedness, etc., will affect learning. Problem in sense organs will lead to improper perception. Chronic illnesses may lead to fatigue and lack of interest.

In addition to physical health, the mental health of learner is also important.

Adjustment problems, minor mental problems like worry, anxiety, stress, and inferiority complexes will affect learning.

7) Maturation of the learner:

Maturation and learning go hand in hand. We learn things only according to maturity of our body. For example, a child of 6 months cannot learn to ride a bicycle even after vigorous training, because it requires muscular or physical maturity.

Factors related to learning material:

The nature of learning material is also important. The meaningful material can be learnt better and more quickly than meaningless material. Because understanding of lessons create interest in the learner. In addition to meaning, the simple material can be learnt better than the complex material.

II. Factors Related to Learning Process :

1. Methods of learning:

Effective learning depends upon the methods of study also. There are certain methods which save the energy and time of the learner. These are called 'economic methods of learning'. They are:

a. Part v/s whole method:

Smaller and shorter lessons may be learnt at a stretch-called whole method. If the material is too lengthy, it must be divided into parts, so that it will be easy for learning. After reading in parts the learnt material should be connected or associated with each other.

b. Spaced v/s un-spaced method:

Learning continuously without gap leads to interference in memory called inhibition. Hence, it is always advisable to keep small interval between each reading.

c. Recitation v/s repetition:

Just repetition of lessons becomes rote learning in which chances of forgetting are more. In recitation the learner will check the weak points which may be forgotten and put more emphasis on those points. This process will help to overcome missing of points from the memory.

2. Over learning;

It is experimentally proved that over learning helps better learning and memory.

3. Knowledge of results as feedback:

It is essential to know the amount of material grasped, so that changes may be made in process of learning. Knowledge of results refers to getting feedback by means of testing, examination, interview, etc.

4. Good physical atmosphere:

Sufficient light and ventilation, calm and clean place, normal temperature, some minimum furniture will help learning processes.

2.4 Theories of learning: Classical and operant conditioning, Trial and error, Insightful learning, Basic ideas of Vygotsky

Theories of Learning:

Psychologists have tried to explain how people learn and why they learn. They have conducted many experiments on animals and children and came to certain definite conclusions which explain the modes of learning.

These are called as theories of learning. The term learning is very comprehensive. It covers a wide range of activities which cannot be explained within a limited framework. There are many theories explaining modes of learning. Important among them are:

A. Learning by Conditioning:

In literal sense, conditioning means 'getting used' to, or 'adjusted 'to a new situation, or a stimulus. It is a process of substituting the original stimulus by a new one and connecting the response with it. There are two types of conditioning theories:

1. Classical conditioning:

This method of conditioning got its name from the fact that, it is a kind of learning situation that existed in the early classical experiments of Ivan P Pavlov (1849-1936), Russian physiologist who was awarded Nobel Prize, in 1904 for his experiments.

Pavlov designed an apparatus to measure the quantity of saliva produced in response to food (meat power). At the beginning of his experiment Pavlov noted that no saliva flowed when he rang the bell. He then trained the dog by sounding the bell, and shortly afterwards presenting food.

After the sound of the bell had been paired with food a few times, he tested the effects of the training by measuring the amount of saliva that flowed when he rang

the bell and did not present food. He found that some saliva was produced in response to the sound of the bell alone. He then resumed the training-paired presentation of bell and food a few times and then tested again with the bell alone.

As the training continued, the amount of saliva on tests with the bell alone increased. Thus, after training the dog's mouth watered-salivated- whenever the bell was sounded. This is what was learned; it is the conditioned response.

This theory states that CS (bell) becomes a substitute after pairing with UCS (food) and acquires the capacity to elicit a response. It is because the association (conditioning) is formed between CS and UCS. This may be symbolically presented as follows;

UCS ⟷ UCR

(Food) (Saliva)

↓ (Conditioning)

CS ⟷ CR

(Bell) (Saliva)

Sub-principles of Classical Conditioning:

There are certain sub-principles which explain the different phenomena of this experiment.

a. Extinction and spontaneous recovery:

Extinction means cessation of a response. The strength of the CS gradually decreases when it is presented alone and not followed by UCS for a number of trails. This process is called 'extinction'. In this experiment when only bell is presented without food for a number of trials, the dog stopped salivation gradually.

But when the CS (bell) was paired again with UCS (food) for some trials, the CR (salivation) recovered. This is known as 'spontaneous recovery'. In spontaneous recovery the dog required less number of trials than the first time, because the association between CS and UCS still existed in the brain of the animal.

b. Stimulus generalization:

A tendency to respond to a stimulus which is similar to original one is called stimulus generalization, the greater the similarity, the more the generalization. In this experiment, the dog started salivating even for the sound of a buzzer which was similar to bell.

c. Stimulus discrimination:

When there is much difference between two stimuli, the animal can discriminate between the two. For example, if the dog is conditioned to salivate at the signal of red light, it will not salivate when green light is presented.

d. Higher order conditioning:

If a 'light' is presented followed by bell and then by food for a number of trials, the dog will start salivating to light itself. This phenomenon is called higher order condition.

All these principles are very useful in behaviour therapy. Conditioning is not confined only to the laboratory.

In our day-to- day's life we come across many instances of such learning. For example, a small child who does not know, touches a burning candle, it gives him a painful experience and withdraws his hand. Later this experience will make him withdraw from burning objects and avoid them all together.

Conditioning is used as psychotherapeutic technique very effectively in the treatment of abnormal behaviours such as phobias, alcoholism, enuresis, etc. These are called behaviour modification techniques. Watson and others have conducted many experiments to prove the usefulness of this method.

2. Operant Conditioning:

This method of conditioning was developed by an American psychologist BF Skinner. This theory is also known as 'Instrumental conditioning', because the animals use certain operations or actions as instruments to find solution.

Skinner conducted his famous experiment by placing a hungry rat in a box called after his name 'Skinner box'. This box was containing a lever and a food tray in a corner of the box. It was so arranged, that the animal was free to move inside the box, but the pressing of the lever would get the animal a pallet of food in the tray as reinforcement.

Arrangement was also made to record the number of pressings of the lever by a mechanical device. It was found in the beginning that the rat pressed the lever occasionally and used to get food as reinforcement for each pressing.

Gradually, as the animal learnt the pressing of lever would give some food, it repeated the responses very rapidly. This rapid increase in pressing the lever is the indication of the animal conditioned to get food.

In day-to-day's life also, much learning takes place in animals as well as in human

beings by this method. The reinforcement will be the motivating factor. It will make the organism to repeat its action.

It is on the basis of these experiments, Skinner made his famous statement "Rewarded behaviour is repeated". Instrumental conditioning involves more activity by the learner than classical conditioning. Skinner conducted his experiments on different animals like pigeons, rats, etc.

Reinforcement which is the most important aspect of this experiment is divided into two types: positive reinforcement is used in reward training. Negative reinforcement-like punishment is used to stop undesired responses or behaviours. Operant conditioning is useful in shaping undesirable behaviour and also in modification of behaviour.

This is also useful in training of mentally retarded children to learn dressing, eating and toilet training skills, treatment of phobias, drug and alcohol addictions, and psychotherapy and to teach needed behaviour in children. Further, these experiments have proved that intermittent reinforcement yields better results than continuous reinforcement.

B. Trial and Error Learning Theory:

This theory was developed by an American Psychologist E. L Thorndike (1874-1949). He argues that learning takes place through trial and error method. According to him learning is a gradual process where the individual will make many attempts to learn. The essence of this theory is-as the trials increase, the errors decrease.

This is possible because of association formed between sense impressions and impulses to action. Such an association comes to be known as a 'bond' or a 'connection, because it is these bonds or connections which become strengthened or weakened in making and breaking of habits. According to this theory when an individual is placed in a new situation, he makes a number of random movements. Among them, those which are unsuccessful are eliminated and the successful ones are fixed.

These random movements are not eliminated at once. In the first attempt their number is very large, in the second attempt the number of errors diminishes and the range of activity becomes narrower. Gradually the individual learns to avoid unnecessary movements and reaches the goal. Improvement takes place through repetition.

Thorndike studied the character of trial and error learning in a number of experiments on cats-using a box which he called 'puzzle box'. In one of the experiments a hungry cat was placed in the box and the door was closed which could be opened by pressing a latch. A fish was placed outside the box in a plate.

The cat could see this fish. The cat was given 100 trials, ten in the morning and ten in each afternoon for five days. The cat was fed at the end of each experimental period and then was given nothing more to eat until after the next session. If succeeded in opening the door in any trial by chance, he went to eat food (fish). A complete record was made of the cat's behaviour during each trial.

In the beginning the cat made a number of random movements like biting, clawing, dashing, etc. gradually in subsequent trials the cat reduced the incorrect responses (errors), as it was in a position to manipulate the latch as soon as it was put in the box.

This experiment revealed that the random movements were decreased gradually, that is-as the trials increased the errors decreased. As the trials increased the solution to open the door (pressing the latch) was discovered and at the end, the cat could open the door with zero error. The time taken in each trial was eventually reduced.

Thorndike conducted many experiments with maze and puzzle box learning in which cats and rats were used. He has demonstrated that through numerous trials the animal learns much and gradually improves his effort.

We all learn many skills like swimming, cycling, riding, etc., through this method. Children learn to sit, stand, walk, and run by this method only. However, this method involves considerable waste of time and effort.

Laws of Learning:

EL Thorndike has explained three laws of learning called Primary laws and in addition to these, he has also framed 5 subsidiary laws in connection with his trial and error learning theory.

Primary laws:

These are the most important laws, which explain the basic aspects of learning. They are:

1. Law of readiness:

By readiness means the organism is ready to respond or act. This is more essential prerequisite for learning.

This indicates that the animal or human being is motivated to learn. This condition of readiness has two effects— satisfaction and annoyance. When the animal is ready to act- if permitted- it gives pleasure. If it is not permitted, it feels annoyed.

In the same way when the animal is not ready to learn- if asked to learn- it is annoying. On the other hand, if it is prevented from learning it gives pleasure.

These points have been given below in the words of Thorndike:

a. For a conduction unit ready to conduct-to conduct is satisfying. b. For a conduction unit ready to conduct-not to conduct is annoying, c. For a conduction unit not ready to conduct- to conduct is annoying.

This law clearly shows that readiness of a person to learn is very important. Hence motivate him to learn.

2. Law of exercise:

This law is also known as law of frequency. Frequency refers to number of repetitions of learning. Thorndike believed that repeated exercising of a response strengthens its connection with stimulus.

This aspect refers to law of use and disuse, which explains that, anything not in use will perish. So also if the response is not repeated, its bond with stimulus gets weakened. This is also according to the statement that 'practice makes man perfect'.

In Thorndike's experiment the cat becomes perfect after repeating the response more number of times, i.e. it learnt to open the door without committing any error.

3. Law of effect:

This law states that when a connection is accomplished by satisfying effect- its strength is increased. By this, Thorndike meant that the probability of its occurrence is greater. In his experiment if the hungry cat succeeded in opening the door, would get its favourable dish to eat.

This had a positive effect on its response. Rewards always strengthen connections between stimuli and responses, and on the other hand, punishment weakens connections.

Secondary laws:

In addition to the three primary laws explained above, Thorndike has given five secondary or subsidiary laws also.

They are as follows:

a. Law of multiple response:

It means when a response fails to elicit a desired effect, the learner will try with new responses until the goal is reached.

b. Law of set or attitude:

Mental set or positive attitude is very important in any learning.

c. Law of associative shifting:

This is nothing but shifting of the response to a new situation which is similar to the earlier one. Because the fundamental notion is that, if a response can be kept intact through a series of changes in stimulating situation, it may finally be given to a new situation.

d. Law of prepotency of elements:

This law states that the learner is able to react in a selected way, only to the salient elements of the problem and not for other unimportant elements.

e. Law of response by analogy:

It means comparing a new situation to the previously learned one and thus giving a response by analogy.

As stated above, Thorndike formulated these laws on the basis of his experiments. According to the law of readiness, the cat was ready to learn, because it was hungry. This hunger motivated the cat to learn to open the door.

According to the second law, the cat was repeatedly given trials and exercise which strengthened its learning. Finally, on each trial the cat was given reinforcement in the form offish.

This encouraged the cat to continue its effort to learn to open the door. The secondary laws given by him support these findings. These laws are highly relevant to the field of education. The teachers can make use of these laws in order to make their teaching more effective.

C. Learning by Insight:

Many times learning proceeds by the more efficient process of trying those methods which are seem to have a relation to solution. This is possible by understanding or perception of the situation.

Learning by perceiving the relationship in the scene and understanding the situation is insightful learning. This theory was developed by a psychologist known as Wolf gang Kohler, who belonged to Gestalt school of psychology.

According to Gestalt theory—perception of a situation as a 'whole' gives better understanding than sum total of its parts. That is, the situation viewed as a whole will definitely look different from that, viewed through its parts.

Kohler conducted his most famous experiments on chimpanzee- called Sultan. In the experiment, Sultan was put in a cage and a banana was placed at some distance

outside the cage. Then the chimpanzee was given two sticks, so constructed that one stick could be fitted into another and make the stick longer.

The hungry Sultan first attempted with its hands to get the banana. Then he took one of the sticks and tried to pull the banana nearer, then tried with other stick, but failed to reach it. By this effort, the chimpanzee became tired and left the attempts to reach banana and started playing with sticks.

While playing so, one of the sticks got fitted into the other and the stick became lengthier. Immediately Sultan became elated and pulled the banana with this long stick and ate it. This 'sudden flash of idea' to reach food with longer stick was called as 'Insight', by Kohler.

He conducted many experiments to prove that learning takes place also by insight and not only by trial and error. He concluded that the occurrence of insight to find solution to a problem is possible by perception of the whole situation.

Kohler conducted many experiments on this line of learning to prove that, just trial and error method is not enough to find solution for many complex problems.

Trial and error or association through connectionism and conditioning may account for simple acquisition of knowledge, skills, interests, habits and other personality characteristics. But it is absolutely insufficient for solving complex problems.

It is here the method of insightful learning is very useful. Because it involves many higher mental processes such as thinking, reasoning, intelligence, etc.

Insight occurs, when the individual sees in a flash, the solution to his problem or difficulty. It is not blind or stupid learning. It is an intelligent way of learning. In many occasions people try to size up the situation, things and arrive at a conclusion. With experience man is able to solve problems better and sooner.

He exercises his discrimination ability in solving problems, and learning becomes a matter of insight rather than of trial and error. Archimedes' example of Aha' experience (eureka) explained in creative thinking is the appropriate example for occurrence of insight.

Five Principles of Gestalt's Theory of Learning

The five principles of Gestalt are simple but influential laws of visual perception, stemming from Gestalt theory in psychology. The theory explains that, if certain principles are applied, humans tend to visually perceive layout, structure or "whole" over their individual units. In essence, humans then perceive the whole structure or pattern over the sum of its parts. These principles have become popular within many disciplines, including music, linguistics and visual art and design, since can they

provide explanations about the effects on human perception during communication. These five principles are discussed briefly as under:

Similarity

The principle of similarity states that if objects or units look similar to one another, then they will be visually perceived as part of a group, structure or pattern. For example, if units share similarities in characteristics such as shape, color or size, the human mind will group these units together. Following this principle, the visual focal point becomes that which is dissimilar or anomalous to the others. The principle of similarity becomes very powerful in fields such as graphic and Web design.

Continuity

The good continuation, or continuity, law of perception states that humans seek relationships between units and therefore will follow shapes and lines beyond their ending points. Human perception tends to continue the created order or pattern rather than deviate from what has already been established. The law of continuity works with spatial patterns, but also across time as well. For example, as opposed to hearing individual notes, listeners tend to hear a melody.

Figure and Ground

The figure-ground principle holds that human perception separates an object from its surrounding. A unit is either perceived as either a "figure"— the object of focus ~ or the "ground" ~ the surrounding background area. Depending on characteristics such as contrasting color or size, the eye perceives these figures as being separate from the background. The "ground" or background space is also often called "negative space."

Proximity

The law of proximity maintains that humans tends to visually group units or shapes together if they are close to each other. Items far apart from each other are perceived as separate. For example, readers tend to see words ~ composed of letter units ~ as wholes, because the specific letters are closer to each other in each group. When there is a gap or space, perception is interrupted and the perceiver has a more difficult time ascertaining organization or order.

Closure

The law of closure exists when human perception tends to see complete, whole figures, even if there are gaps or missing pieces of information. The human brain has

a tendency to close gaps and provide the missing information, especially when the pattern or form is familiar. For this closure to occur, the gaps between the pattern or form must be easily filled. This principle is used in cartoon animation to create motion between still images.

D. Vygotsky's Learning Theory- Basic Ideas

Vygotsky focused on the connections between people and the sociocultural context in which they act and interact in shared experience. According to Vygotsky, humans use tools that develop from a culture, such as speech and writing, to mediate their social environments. Initially children develop these tools to serve solely as social functions, ways to communicate needs. Vygotsky believed that the internalization of these tools led to higher thinking skills.

Vygotsky's Social Development Theory, or SDT, introduced **two major principles:**

1 Cognitive development is limited up to a certain extent or within a certain range, at any given age of the individual; and

2. An individual's full cognitive development requires social interaction.

These principles are encapsulated in three theories or themes: Social Interaction, The More Knowledgeable Other (MKO) and the Zone of Proximal Development (ZPD).

The ZPD is the distance between a student's ability to perform a task under adult guidance and/or with peer collaboration and the student's ability to solve the problem independently. According to Vygotsky, learning occurred in this zone.

Applications of the Vygotsky's Social Development Theory

Many schools have traditionally held a transmissionist or instructionist model in which a teacher or lecturer 'transmits' information to students. In contrast, Vygotsky's theory promotes learning contexts in which students play an active role in learning. Roles of the teacher and student are therefore shifted, as a teacher should collaborate with his or her students in order to help facilitate meaning construction in students. Learning therefore becomes a reciprocal experience for the students and teacher.

2.5 Transfer of learning: concept, types and theories Concept:

Transfer of learning is the dependency of human conduct, learning, or performance on prior experience. The notion was originally introduced as transfer of practiceby

Edward Thorndikeand Robert S. Woodworth. They explored how individuals would transfer learning in one context to another. Their theory implied that transfer of learning depends on how similar the learning task and transfer tasks are, ór where "identical elements are concerned in the influencing and influenced function", now known as the identical element theory.

In present context, transfer of learning is usually described as the process and the effective extent to which past experiences (also referred to as the transfer source) affect learning and performance in a new situation (the transfer target).However, there remains controversy as to how transfer of learning should be conceptualized and explained, what its prevalence is, what its relation is to learning in general, and whether it exists at all.There are a wide variety of theoretical frameworks apparent which can be categorized as;

- a taxonomical approach that categorizes transfer into different types;
- an application domain-driven approach that focuses on developments and contributions of different disciplines;
- the examination of the psychological functions or faculties transfer models invoke; and
- a concept-driven evaluation, which reveals compares and contrasts theoretical and empirical traditions.

Definitions of Transfer

- when learning in one context enhances (or undermines) a related performance in another context. (Perkins and Salomon, 1992).
- The ability to extend what has been learned in one context to new contexts (Brandsford, Brown, Cocking, 1999)
- The process of using knowledge or skills acquired in one context in a new or varied context. (Alexander and Murphy, 1992)

Types of Transfer

After reviewing various literature on the types of transfer, the following are considered here for discussion:

- Positive transfer - when learning in one context enhances a related performance in another context.
- Negative Transfer - when learning in one context undermines a related performance in another context.

- Near transfer - transfer between very similar but not identical contexts.
- Far transfer - transfer between contexts that, on appearance, seem remote and alien to one another. Applying learning to situations that are quite dissimilar to the original learning.
- Low road transfer (also known as reflexive transfer) involves the triggering of well-practiced routines by stimulus conditions similar to those in the learning context.
- High road transfer (also known as mindful transfer) involves deliberate effortful abstraction and a search for connections.
- Forward reaching transfer (a form of "high road" transfer) - one learns something and abstracts it in preparation for application elsewhere.
- Backward reaching transfer (a form of "high road" transfer) - one finds oneself in a problem situation, abstracts key characteristics from the situation, and reaches backward into one's experience for matches.

Learning Theories and Transfer of Learning

Learning theories actually calls for educational transfer. Educational transfer is important and should be taken in consideration that researchers, educators, and the like need to know how to teach for transfer. The idea of transfer is rarely specified. However, it is one of the most important goals that we can teach our students. The ultimate goal is for the student to be able to apply their knowledge and skills inside and outside of the classroom. Transfer of knowledge goes far beyond simply repeating memorized material but to being able to take old knowledge and experiences and apply this old knowledge to a new concept and being able to use both the new and old knowledge to cracking a problem that you have never encountered before. This mode of thinking about the process of learning and transfer resonates with the Gestalt theory of learning.

There are six important theories which explain transfer of learning. These are known as modern theories.

1. Theory of identical elements:

This theory has been developed by E.L.Thorndike. According to him most of transfer occurs from one situation to another in which there are most similar or identical elements. This theory explains that carrying over from one situation to another is

roughly proportional to the degree of resemblance in situation, in other words- more the similarity, more the transfer. The degree of transfer increases as the similarity of elements increase. For example, learning to ride moped is easy after learning to ride a bicycle. Here, transfer is very fast because of identical elements in both vehicles. Thorndike was convinced that the method used in guiding a pupil's learning activities had a great effect upon the degree of transferability of his learning.

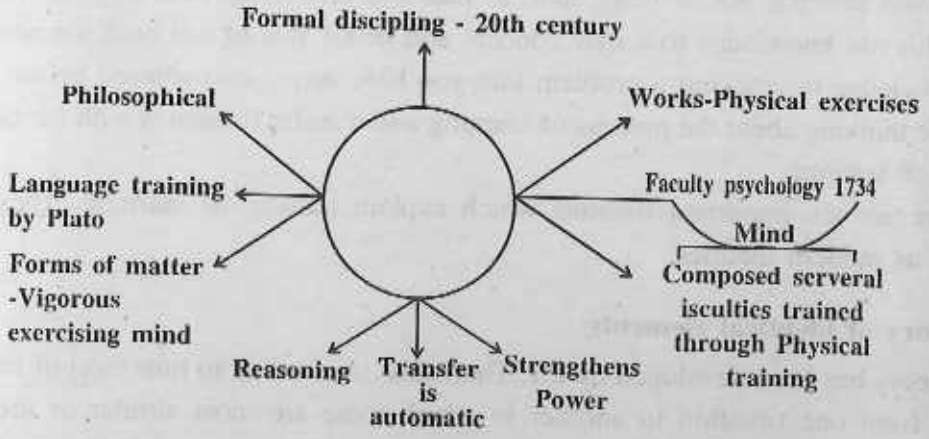
2. Theory of generalization of experience:

This theory was developed by Charles Judd. Theory of generalization assumes that what is learnt in task 'A' transfers to task 'B', because in studying 'A', the learner develops a general principle which applies in part or completely in both 'A' and 'B'. Experiences, habits, knowledge gained in one situation help us to the extent to which they can be generalized and applied to another situation. Generalization consists of perceiving and understanding what is common to a number of situations. The ability of individuals to generalize knowledge varies with the degree of their intelligence.

3. Mental Discipline:

This theory came to existence in 20th century. It is philosophical in nature. Mind is the central position which is composed of several facilities. These faculties are to be trained through muscular and physical training. This facility psychology developed during 1734.

The diagram below explicates the theory of mental discipline:



4. Transposition:

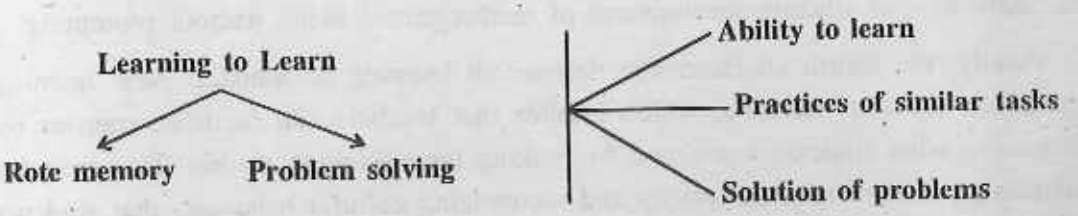
It is advocated by Gestalt psychology. Transfer starts in understanding the fact and perception of similarity by the learner. It is known as pattern of relationship. It is not the specific skills or facts or even underlying principles which are important, but the understanding of relationship between facts, process and the principles are the real basis of transfer.

5. Ideals:

It was propounded by W.C. Bagley. When ideas are stressed are perused then transfer of learning can take place. Ideas like honesty, truthfulness, love etc. can be transferred in this theory.

6. Learning to Learn:

After practicing a series of related or similar tasks then learner learns the capacity to learn the same thing. It is found that whenever learner comes in contact with various learning materials then he learns efficiently and effectively. Learning to learn means when learning starts from one method then it goes to another method. The flow-diagram below explicates the theoretical components of learning to learn.



Learning and transfer: implications for educational practice

A modern view of transfer in the context of educational practice shows little need to distinguish between the general and specific paradigms, recognizing the role of both identical elements and metacognition. In this view, the work of Bransford, Brown and Cocking (1999) identified four key characteristics of learning as applied to transfer. They are:

1 . The necessity of initial learning;
2. The importance of abstract and contextual knowledge;
3. The conception of learning as an active and dynamic process; and

4. The notion that all learning is transfer.

A student- learning centred view of transfer embodies the following four characteristics. With this conception, teachers can help students' transfer of learning not just between contexts in academics, but also to common home, work, or community environments.

First, the necessity of initial learning for transfer specifies that mere exposure or memorization is not learning; there must be understanding. Learning as understanding takes time, such that expertise with deep, organized knowledge improves transfer. Teaching that emphasizes how to use knowledge or that improves motivation should enhance transfer.

Second, while knowledge anchored in context is important for initial learning, it is also inflexible without some level of abstraction that goes beyond the context. Practices to improve transfer include having students specify connections across multiple contexts or having them develop general solutions and strategies that would apply beyond a single-context case.

Third, learning should be considered an active and dynamic process, not a static product. Instead of one-shot tests that follow learning tasks, students can improve transfer by engaging in assessments that extend beyond current abilities. Improving transfer in this way requires instructor prompts to assist students - such as dynamic assessments - or student development of metacognitive skills without prompting.

Finally, the fourth characteristic defines all learning as transfer. New learning builds on previous learning, which implies that teachers can facilitate transfer by activating what students know and by making their thinking visible. This includes addressing student misconceptions and recognizing cultural behaviors that students bring to learning situations.

In school, we often learn new lessons that entail us to build on more basic information and procedures we learned previously. The challenge for the teacher is then to promote the transfer. While many times students subconsciously apply the previous lessons to the new situation, they will sometimes need help. A teacher should be prepared to help their students when facing a new lesson. Also remind them of previous lessons or experiences and then help them to see how they could apply the previous information to the new situation.

2.6 Motivation: Types, Factors and Roles of motivation in learning :

Concept

Motivation is the reason for people's actions, desires, and needs. Motivation is also one's direction to behavior, or what causes a person to want to repeat a behavior. An individual's motivation may be inspired by others or events (extrinsic motivation) or it may come from within the individual (intrinsic motivation). Motivation has been considered as one of the most important reasons that inspires a person to move forward.

Definition:

Atkinson defined motivation as "The term, motivation refers to the arousal of tendency to act to produce one or more effects".

According to Maslow, "Motivation is constant, never ending, fluctuating and complex and that it is an almost universal characteristic of particularly every organismic state of affairs".

Motivation is of particular interest to educational psychologists because of the crucial role it plays in student learning. However, the specific kind of motivation that is studied in the specialized setting of education differs qualitatively from the more general forms of motivation studied by psychologists in other fields.

Motivation in education can have several effects on how students learn and how they behave towards subject matter. It can:

1. Direct behavior toward particular goals
2. Lead to increased effort and energy
3. Increase initiation of, and persistence in, activities
4. Enhance cognitive processing
5. Determine what consequences are reinforcing
6. Lead to improved performance.

Because students are not always internally motivated, they sometimes need situated motivation, which is found in environmental conditions that the teacher creates.

If teachers decided to extrinsically reward productive student behaviors, they may find it difficult to extricate themselves from that path. Consequently, student dependency on extrinsic rewards represents one of the greatest detractors from their use in the classroom.

Types of Motivation:

There are four types of motivation, namely,

- Intrinsic motivation
- Extrinsic motivation
- Identified
- Introjected

The following diagram will help you understand the source and actions defining the types of motivation:

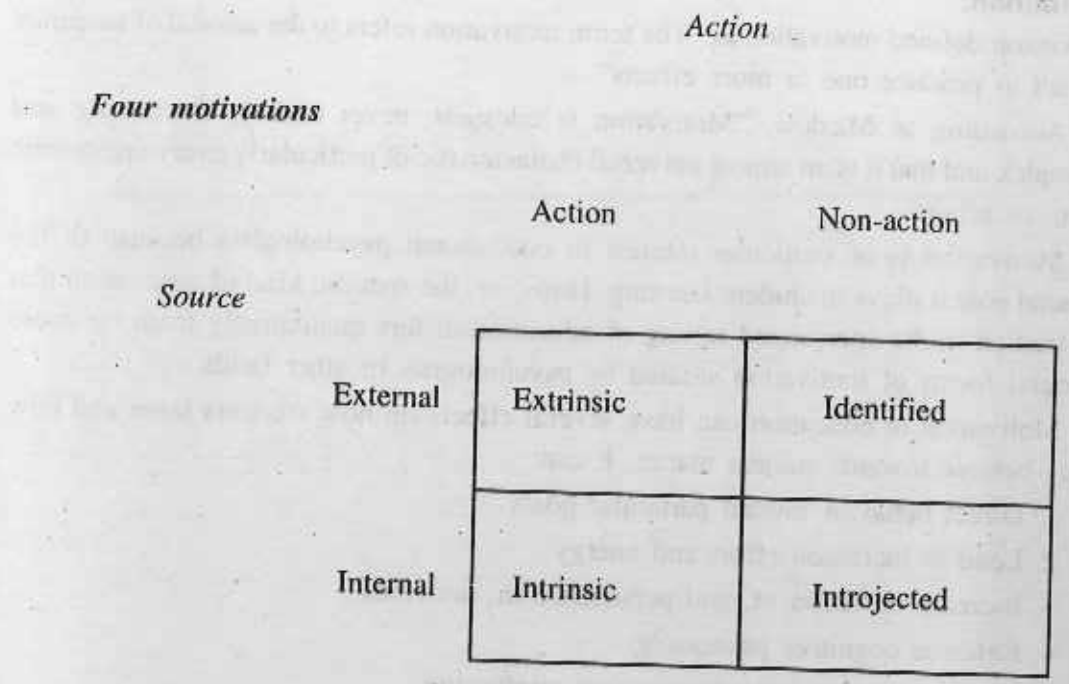


Fig Four types of motivation

I Extrinsic Motivation

Extrinsic motivation comes from outside us. We do it because we are impelled to, for example because we are told to by someone who has power over us.Many employment motivation systems work on the principle of extrinsic reward, where people are 'bought' and then j commanded. Whilst this is effective for simple activities, it is less useful when you want a person to be self-driven.

2. Intrinsic Motivation

Intrinsic motivation is done for internal reasons, for example to align with values or simply for the hedonistic pleasure of doing something. In work, people are intrinsically motivated by working for an inspiring leader or in areas where they have a personal interest.

3. Introjected Motivation

Introjected motivation is similar to intrinsic motivation in that it is internalized. The distinctive aspect of this is that if it is not done, then the person feels the tension of guilt.

4. Identified Motivation

Identified motivation is where a person knows that something needs doing but has not yet decided to do anything about it.

Generally, motivation is conceptualized as either intrinsic or extrinsic. Classically, these categories are regarded as distinct. Today, these concepts are less likely to be used as distinct categories, but instead as two ideal types that define a continuum.

Factors of motivation:

Motivating factors sometimes include achievement, advancement, autonomy, personal growth, recognition, responsibility, and the work itself.

1. Discipline: It's important to have a clear idea of what your goal is, and then commit yourself to { achieving it in a disciplined manner.

2. Positivity: Having a positive, optimistic mind-set is also essential for staying motivated. As humans we have free will, and we are free to choose what we want to do in life, and how we want to spend our time. We are masters of our own ship. It's important to remember that.

3. Resilience; It essentially means developing the ability to 'bounce back' from difficult moments during your journey toward your goal. Financial issues, family disputes, illness: sometimes these things pop up and attempt to derail our plans. But it's important to keep going. (Once again, discipline helps a lot in these situations.)

Also keep in mind that resilience does not mean **'tolerance'** of stressful conditions. If you're in a relationship that's holding you back, you have the free will to change it or get out of it. Whatever the case, strive to come up with solutions, rather than just wallow in your problems.

4. Self-Knowledge: Lastly, an important component of staying motivated is simply

knowing yourself. At what time of day do you feel most awake, most 'in the zone'? Is it easier for you to focus in a quiet place like a library, or somewhere with a bit of background noise like a coffee shop? What are you spending most of your time doing, and is it related to your number one priority? (Be honest.)

We find it necessary to define factors affecting motivation first to understand how to improve the child's desire to learn.

- 3.2.1 Self-efficacy and competence perceptions. ...
- 3.2.2 Attributions and **control** beliefs....
- 3.2.3 Higher level of interest. ...
- 3.2.4 Higher levels **of value....**
- 3.2.5 Goals and goal orientation

Roles of Motivation in Learning:

Every teacher daily faces a number of behaviour problems. For the explanation of these problems, he has to turn to psychology of motivation. This is great problem for teachers, parents and administrators and for those who are interested in the improvement of performance and learning of people for action. Students in the classroom learning require constant motivation from the teacher so that maximum use of their talents may be made for their welfare and also for the welfare and progress of the society. The process of motivation is a highly individualized activity in the sense that causes underlying behaviour are always multiple and complex rather than single and simple. A learner may be motivated for an action in a particular situation and the other learner may not be motivated in that situation and even the same learner may not be motivated under the same situation on some different occasions. A number of variables operate in the process of motivation which cause variation in the individuals. The socio-economic condition, previous experience, age and social climate in the classroom affect the process of motivation.

Psychologists have developed some common techniques which may be used by classroom teachers to motivate children in their work. The teacher should not strictly adhere to one theory of motivation but he should make use of various approaches in his teaching, keeping into consideration the individual differences among the studies. Below are given some of the important techniques of motivation in the classroom teaching - learning situations :

1. Use of principles of pleasure and pain : The oldest theory of behaviour holds that pleasant experiences which give satisfaction are sought and painful experiences are avoided by the organism. This theory has direct implication in classroom teaching

- learning in the sense that the teacher must provided pleasant and satisfying experiences to his students. Such type of experiences will motivate students for further learning.

2. Use of rewards and punishment : The teacher must occasionally administer reward and punishment in his classroom teaching. Rewards create interest in the students. They are motivated to get the reward. The teacher must use punishment very sparingly because punishment creates behaviour troubles. He may use reward of different types such as material, symbolic and psychological. Reward has a positive effect in motivating children for learning.

The teacher must remain cautions that the reward should not become an end in itself but it should create learning desire in the learner. Recent studies conducted on reward have proved that reward in the form of grades tends to encourage conformity and inhibit creativity in the learners.

The teacher must see that rewards for learning should be so engineered that after serving their introducing role, they should lead learners to independent learning beyond the classroom situation.

3. Aspiration level : It means the level of performance to which one aspires for future. The teacher must see that the activity of the class is tailored in accordance with the aspiration level of the students. The teacher should design the level of difficulty of classroom task keeping into consideration the level of aspiration of the class. According to Barow (1956), the level of aspiration depends on several factors like intelligence, socio- economic, status, parental relation and expectation from children. The teacher should organize activity in such a way that students should keep striving and give a promise of goal attainment. Classroom goals should be attainable and the students should feel that they are able to achieve them. School work must be sufficiently varied and paced so that every pupil may succeed at his level. The students should be encouraged to participate in learning activity in the class. The students' active participation is very essential to arouse their interest in learning .

4. Use of praise and reproof : It is human nature that everyone expects some praise for his achievement. An experiment was conducts by Hurlock to study the effects of praise and blame on children. She found that praise is more effective than blame for motivating children. Praise and blame have different effects on individual students. Some students may be praised for minor achievement because of their abilities but others will be motivated by praise for most worthy accomplishments related to their high ability. Praise can be used in many ways, like a nod of teacher, smile, a good look and verbal praise etc. The teacher should be cautions while using praise in the classroom. For each and every activity, children should not be praised.

Blame should be sparingly used because it creates personality maladjustment. Successful use of praise and blame depends upon the students, their personality and prior learning experiences .

5. Use of competition and cooperation : Teacher should stress on friendly relationship rather than rivalry that breeds interpersonal antagonism among students. Competition should involve a degree of equality among contestants.

Competition may be of three types :

a) Interpersonal competition among peers .

b) Group competition.

c) Competition with oneself.

The teacher can use all the three types of competition in his teaching. Like competition, cooperation is also a strong incentive for motivating children. Lowry (1969) has concluded on the basis of his studies that cooperation is the most basic form of intergroup relationship. Competition and cooperation both can be used in the classroom learning for gaining high scores .The teacher should encourage active participation of all the students in learning activities .

6. Knowledge of the result (feedback) : It is true that some events following a response tend to increase the frequency of the response. The events are commonly called reinforced and constitute a broad category of events. Some of the reinforcers have been mentioned above as pleasure and pain, reward and punishment, praise and blame etc.

7. Novelty : Every novel thing interest in the individual. Teachers must introduce novelty into teaching. Novelty has merit when the teacher points out the relation between the new and already known, uses familiar procedures and himself shows enthusiasm or the expansion of knowledge in new areas. The teacher should present the subject matter in a variety of ways to bring novelty in his teaching. No doubt the development of such a situation taxes the teacher's ingenuity to the limit and often calls for more free time than any teacher can give. Some encouragement of this approach is found in present trends toward giving teachers time during school hours when they can develop such materials but many schools have limited resources for such activities.

8. Setting of goal : Motivation is goal - oriented behaviour that leads to drive reduction in the organism. We can mention that the goal, which the student sets for himself, plays an important role. If a student has a worthwhile goal, then he is willing to forego immediate pleasure and even expose himself to some suffering in his effort

to bring him closer to his goal, Goal - setting is an important component of human motivation. The teacher should set attainable goals both for individuals and the class.

9. Avoid the use of stressful procedures : No doubt, some amount of mild anxiety accelerates the problem solving efforts of the student but too much anxiety and tension disorganizes the cognitive process and hinders the performance of the learners. The teacher should create mild tension in his student to motivate them.

10. Provide real life and symbolic models : It is a fact that most of the learning in human beings is acquired through the process of observation and imitation. The teacher can influence the behaviour of his students by his attitude and ideal living, written or verbal presentation, and by use of audio-visual techniques.

11. Create needs to learn and involve students : The teacher must create psychological and social needs for learning in his students. The importance of classroom learning should be related to the future life of the students. The students should be actively involved in learning tasks.

Twelve practical methods of motivating people have been identified by McClelland (1962) from researches conducted by him are as under:

1. Goal- Setting—Describe and set goals that learners will achieve.

2. Giving reasons—Tell the learners that the course is important for successful living.

3. Teaching thoughts that motivate—Drive and determination lead to success. Create confidence in learners.

4. Relating thoughts to action—Learners should be encouraged to study in library, take interest in doing things and show interest in others.

5. Relate the course to life—Tell the learners how learning experiences in the classroom are related to life.

6.Keep a record of progress—Teachers should keep a record of progress of learners and should inform them from time to time to reinforce their behaviour.

7. Give warmth and support—Teachers should give warmth and support to the learning experiences.

8. Provide good environment—Conductive environment should be created in the classroom. 9. Deal with cultural values. Include cultural values.

10. Get commitment from the learners—Get some verbal commitment to a level of performance from learners.

11. Demonstrate progress—Keep charts on individual learners,
12. Use group dynamics.

2.7 Let us sum up

Learning is a key process in human behaviour. All living is learning. If we compare the simple, crude ways in which a child feels and behaves, with the complex modes of adult behaviour, his skills, habits, thought, sentiments and the like- we will know what difference learning has made to the individual.

Now, how can the obstacle be important in the process of learning? If one faces no difficulty of any kind in attaining the goal, he will not bring any change in his present behaviour or stock of knowledge or skills. Thus, the block or the barrier is an essential step in the learning process. This unit presented a categorical discourse of all the components of learning in details. The outcomes of the different theories of learning has presented a practical utility of how learning takes place. Basic ideas of transfer of learning and how it helps in consolidating further learning. The unit also encompassed the theories of transfer and its significance in day to day life of a child/person. Motivation as a pivotal and prime component of learning is dealt here with its various types, factors and its contribution in the learning process.

2.8 Unit end exercise

1. Define learning.
2. Describe the nature of learning.
3. Mention few characteristics of learning.
4. What are the factors that influence learning?
5. What are the conditions of Conditioning?
6. Differentiate between 'classical and operant conditioning'.
7. What is meant by the word 'insight'?
8. State briefly the types of'transfer' in transfer of learning.
9. Define motivation. Give its characteristics.
10. Describe the roles of motivation in learning.

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Unit - 3 □ Intelligence, Memory & Creativity

Structure

3.1 Introduction

The human history envisaged the presence of imprudence and wisdom that was always hand-in-hand. The human brain functions in order to respond to any environmental stimuli. Now, the question arises, who thinks intelligently and who acts foolishly. The present unit provides three concepts that are actually responsible for desirable actions. As we will navigate through the sub-units we will find how the three broad concepts-Intelligence, Creativity and memory unfold their nature and suggest us how to nurture for the desirable or effective behavior. However, in the process of learning and acquainting with the discourses, we will come across various interesting experiments that led the psychologists to arrive and strengthen their inferences. There are numerous examples that support the theories and will help in better understanding of the concepts.

3.2 Objectives

Upon completion you will be able to:

- Define, understand and analyse intelligence, its characteristics, various theories and measurement of intelligence
- Better understand the process of memorisation, its various factors and different types

- Acquaint with the causes of forgetting
- Gain knowledge of creativity in terms of its meaning, nature, and factors
- explain and understand the ways of fostering creativity

3.3 Intelligence: Definition, theories - Spearman, Thurstone, Guilford and Gardner; Measurement of intelligence

Intelligence : Concept and Meaning

Since time immemorial, attempts have been made to understand the meaning and concept of intelligence. Let us get acquainted with the concept and meaning of intelligence by throwing light on the following aspects:

A. Meaning and definition of intelligence.
B. Some established facts about intelligence.
C. Misconception about intelligence.

Meaning and Definition of Intelligence

As discuss earlier, in our day - to - day conversation an individual is said to be intelligent in proportion to his success in general life situations. What is this intelligence that contributes towards such success, is a question that has been attempted by psychologist in different ways resulting in so many varied definitions?Someof the important definitions of intelligence are given below:

Woodworth and Marquis

Intelligence means intellect put to use. It is the use of intellectual abilities for handling a situation or accomplishing any task (1948, p. 33)

Stern

Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements. It is general adaptability to new problems of conditions of life, (1914, p.3)

Term an

An individual is intelligent in proportion as he is able to carry on abstract thinking (1921).

Wagon

Intelligence is the capacity to learn and adjust to relatively new and changing conditions.
(1937,p.401)

David Wechsler

Intelligence is the aggregate or global capacity of an individual to act purposeful to think rationally, and to deal effectively with his environment(1944, p. 3).

ANALYSIS OF THESE DEFINITIONS

Above we have given some definitions, more of such definitions can further be cited. All these definition when taken separately, give an incomplete picture because they partly emphasize that intelligence is the ability -

(i) to learn,

(ii) to deal with abstraction,

(iii) to make adjustment or to adapt to new situations.

The definition given by Wechsler seems to combine all the three viewpoints but this definition too has come under criticism due to difference of opinion among psychologists. Several attempts have been made to reach at some general agreement but in vain. However, British psychologists are said to have reached some measures or agreement regarding a suitable definition of intelligence.

To them intelligence consists of the ability -

(i) to see relevant relationship between objects or ideas; and

(ii) to apply these relationship to novel situations.

It leads to the conclusion that intelligent behaviour can be divided into two categories -theoretical and practical, abstract and concrete. The theoretical operations make an individual capable to face and solve the actual life problems and make adjustment to the environmental situations. If we try to analyze the factor which determines the success of an individual's activities, we can by all means say that cognitive or mental abilities have a dominant role to play in the success or failure. "Intelligence", as Rex and Margaret

Knight have put it, *"is the factor that is common to all mental abilities" (1952, p.!24)and* therefore, the judgement about intelligence can ever be taken with the evaluation of the task one performs, how he reacts and responds to a situation. In this way, if we try to come to the practical ground, we can define intelligence as follows :

Intelligence consists of an individual's those mental or cognitive abilities which help him in solving his actual life -problem and leading a happy and well - contented life.

Some Established-Facts about Intelligence

1. The relation of intelligence with nature and nurture: There have been a number of attempts on the part of psychologists to weigh the relative importance of nature and nurture. The conclusion of their studies reveals that intelligence is the product of heredity and environment. Both are necessary for the intellectual growth of an individual and neither can be considered more important than the other.

2. Distribution of intelligence:There are individual difference with regard to the distribution of intelligence in nature like wealth, health etc. This distribution is governed by a define principle that states "The majority of the people are average, a few very bright and a few very dull."

3. Growth of intelligence : *As* a child grows in age, so does his intelligence as shown by intelligence tests. Now the questions arises as to at what age does this growth cease ? The age of cessation of mental growth varies from individual to individual.However, in majority of cases, intelligence reaches its maximum somewhat at the age of 16 or 20 in an individual. After that the vertical growth of intelligence ceases. But the horizontal growth -

accumulation of knowledge and acquisition of skills - continues throughout the life span of an individual.

4. Intelligence and Sex differences : Various studies have been concluded to find out if women are less intelligent than men and vice versa. The result of these researches have been either ways. In some of the cases, no significant difference has been found. Therefore, it is proper to think that difference in sex does not contribute towards the difference in intelligence.

5. Intelligence and racial or cultural difference :Whether a particular race, caste, or cultural group is superior to other in intelligence - the hypothesis has been examined by many research workers. In U.S.A, it has been a burning problem for centuries. The results of earlier studies, which considers the whites to be a superior race in comparison to the Negroes, have been questioned. Now it has been established that intelligence is not the birth right of a particular race or group. The 'bright' and the 'dull' can be found in any race, caste or cultural group and the differences that are found can be explained in terms of environment influences.

THEORIES OF INTELLIGENCE

With the help of definitions, we can be able to understand how intelligence operates or what type of behaviour makes an individual intelligent or unintelligent. But it does

not explain the structure of intelligence or in other words, the different components or elements of intelligence. The theories of intelligence propagated by psychologists from time to time have tried to answer this question. These theories can be grouped under two heads, namely, factor theories and cognitive theories. However, in this text we will limit our discussion to factor theories.

SPEARMAN'S TWO FACTOR THEORY

This theory was advocated by Spearman. According to him every different intellectual activity involves a general factor 'g' which is shared will all the intellectual activities and a specific factor's'which it shares with none (Fig)

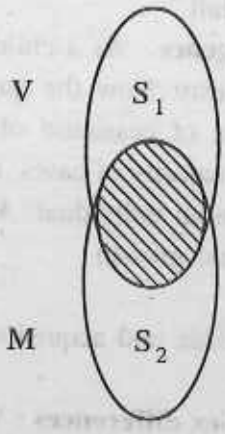

Fig. Spearman's two factor theory

In this way, he suggested that there is something which might be called 'general intelligence', a sort of general mental energy, running through all the different tasks but in addition to this general factor, there are specific abilities, which make an individual able to deal with particular kinds of problems. For example, an individual's performance in Hindi is partly due to his general intelligence and partly some kind of specific ability in language which he might possess, i.e. g + s1 ; or in mathematics his performan, would be due to g + s2 ; or in drawing it will be due to g + s3 ; and so on and so forth. The factor g (in lesser or greater intelligence of such an equation schedule : grounds, some of which degree) will enter in all specific activities. The total ability or intelligence of such an individual (symbolized as A) thus will be expressed by the following equation schedule :

$G + s_1 + s_2 + s_3 + \ldots\ldots\ldots = A$

This two factor theory of Spearman has been critizied on various grounds, some of which have been listed below :

(i) Spearman said that there are only two factors expressing intelligence but as we have seen there are not only two but several factors (g, s_1, s_2, s_3.... etc.) expressing it.

(ii) According to Spearman each task requires some specific ability, This view was not proper as it implied that there was nothing common in the tasks except a general factor and professions such as those of nursing, compounders and doctors could not be put in one group. In fact the factor si, s_2, s_3 ,s_4.....etc are not mutually exclusive. They overlap and give birth to certain common factors.

This idea of overlapping and grouping has been responsible for the origin of a new theory called Group Factor theory.

THURSTONE'S GROUP FACTOR THEORY

For the factors not common to all the intellectual abilities but common to certain activities comprising a group the term 'group factor' was suggested. Prominent among the propagators of this theory is L.L. Thurstone. While working on a test of primary mental abilities, he came to the conclusion that certain mental operations have a primary factor in common which gives them psychological and functional unity and differentiates them from other mental operations.

These mental operations constitute a group factor.So, there are a number of groups of mental abilities each of which has its own primary factor. Thurstone and his associates have differentiated nine such factors. These are :

(i) Verbal factor (V); concerns with comprehension of verbal relations, word and ideas.

(ii) Spatial factor (S) : is involved in any task in which the subject manipulates an object imaginatively in space.

(iii) Numerical factor (N) : concerns with the ability to do numerical calculations, rapidly and accurately.

(iv) Memory factor (M): involves the ability to memorize quickly.

(v) Word Fluency Factor (W) : is involved whenever the subject is asked to think of isolated words at a rapid rate.

(vi) Inductive reasons factor (RI) : concerns with the ability to generalize through specific examples.

(vii) Deductive reasoning factor (RD) : concerns with the ability to make use of generalized result.

(viii) Perceptual factor (P): concerns with the ability to perceive objects accurately.

(ix) Problem - solving ability factor (PS) : concerns with the ability to solve problems independently.

The weakest link in the group factor theory was that it discarded the concept of

common factor. However, it did not take Thurstone too long to realize his mistake and reveal a general factor in addition to group factors.

GUILFORD'S THEORY INVOLVING A MODEL OF INTELLECT

J.P. Guilford and his associates have developed a model of intellect on the basis of the factor analysis of several tests employed for testing intelligence of human beings. They have come to the conclusion that any mental process or intellectual activity of the human being can be described in terms of three basic dimensions or parameters known as operation (the act of thinking or way of processing the information); contents (the term in which we think or the type of information involved); and products (the ideas we come up with i.e. the fruits of a thinking). Each of these parameters - operations, contents and products - may be further subdivided into some specific factors or elements. As a result, operations may be subdivided into 5 specific factors, contents into 5 and products into 6. The interaction of these three parameters, according to Guilford, thus results into the 5 X 5 X 6 = 150 different elements or factors in one's intelligence. In a figural form, these 150 factors or independent abilities of the human beings along with the basic parameters and their divisions can be represented through a model named as Guilford's Model of Intellect or Intelligence.

This model proposes that intelligence consists of 150 independent abilities that result from the interaction of five types of contents, five types of operations and six types of products. Guilford, 1982.

What is implied by these contents, operations and products can be understood through the following brief description.

Content (the type of Information involved).

- Figural (visual) - The properties of stimuli we can experience through visual senses e.g. colour, size, shape, texture and other visual characters of figure.
- Figural (Auditory) - The properties of stimuli we can experience through the auditory sense, e.g. voice and sound.
- Symbolic - Numbers, letters, symbols, designs.
- Semantic - The meaning of words, ideas.
- Behavioural - The actions and expressions of people. Operations (The way of processing information).
- Cognition - Recognizing and discovering.
- Memory - Retaining and recalling the contents of thought.
- Divergent Production - Producing a variety of ideas or solutions to a problem.

- Convergent Production - Producing a single best solution to a problem.
- Evaluation - Taking decision about the nature of the intellectual contents or gathered information whether it is positive or negative, good or bad etc. Products (The results obtained through Operations).
- Units - Individual pieces of information limited in size e.g. a single number, letter or word.
- Classes - Groups of units information related to each other on the basis of some common characteristics involving a higher order concept (e.g. men + women = people).
- Relations - A connection between concepts.
- Systems - An ordering or classification of relations.
- Transformation - Altering or restructuring intellectual contents.
- Implications - Making inferences from separate pieces of information.

In this way according to Guilford's model of intellect, there are 150 factors operating in one's intelligence. Each one of these factors has a trigram symbol, i.e. at least one factor from each category of three parameters has to be present in any specific intellectual activity or mental task.

Let us illustrate this basic fact with an example. Suppose a child is asked to find out the day of the week on a particular date with the help of a calendar. In the execution of this mental task, he will need mental operations like convergent thinking, memory and cognition. For carrying out these operations, he has to make use of the contents. In this particular case, he will make use of semantics, i.e. reading and understanding of the printed words and figures indicating days and dates of a particular month in the calendar. By carrying out mental operation with the help of contents he will finally arrive at the products. The day of the week to which the date in questions refers represents the factor know as "relations". He may further transform and apply this knowledge to identify the days for contiguous dates or vice versa.

In a nutshell each of the seven theories of intelligence described above attempts to provide a structure of intelligence in terms of its constituents or factors. These theories exhibit wide variations in terms of the numbers of factor that they consider important. The range of all such factors also varies from 1 (Unitary theory) to 150 (Guilford's Intellect Model).However, for understanding what goes on inside one's intelligence we must try to build an ecletic view by incorporating the essence of all the workable theories of intelligence. Consequently, any intellectual activity or mental task may be said to involve the following three kinds of basic factors (arranged in

the order as suggested by Vernon or in the form of the model suggested by Guilford).

1. General factor g (Common to all tasks)
2. Specific factors s_1, s_2, etc. (Specific to the tasks)
3. Group factor G (Common to the task belonging to a specific group)

MEASUREMENT OF INTELLIGENCE

Psychologists have devised many such tests for the measurement of intelligence.

Classification of Intelligence Tests

1. As per as the administrative point of view is concerned the intelligence tests can be classified into two categories namely -

(a) Individual tests : In which only one individual is tested at a time.

(b) Group tests : In which a group of individuals is tested at a time.

2. Another way of classifying the intelligence tests is based on the form of the test. Accordingly there are two types of tests :

(a) Verbal or Language tests : These tests make use of language. Here the instructions are given in words (either in written or oral form or both). Individuals are required to use language as well as paper and pencil for giving the responses. The test content of these tests is loaded with verbal material.

(b) Non - Verbal and Non - Language tests : These tests involve such activities in which the use of language is not necessary. The use of language is eliminated from test content and response except in giving directions.

The typical examples of such non-verbal tests are Performance Tests. The principal characteristics of these tests are given below :

(i) Test contents of these tests are in the form of material objects.

(ii) What an individual has to do is indicated by the tester either through oral instructions or by pantomime or signs.

(iii) Individual's responses depend upon what he does nor performs than by what he says or writes.

(iv) Generally these tests are individual tests. As Dr. Filial observes."These cannot be used as group tests, chiefly because it is necessary to supervise the individual testee at work and give him necessary direction." (1972, p.265)

If we try to have a final picture of all the types of tests in intelligence we will have to keep in view both the ways of classifying them as mentioned above.

Now we will discuss these type one by one.

Individual Verbal Tests

The tests involving the use of language and administrated to an individual at a time belong to this category. As an example of such tests we can refer to Stanford

- Binet Scale. It is the revised form of the Binet - Simon test.Actually, French psychologists Alfred Binet is said to be the father of intelligence test construction movement. He, along with Theodore Simon, prepared a test in as early as 1905, comprising 30 items (arranged in order of increasing difficulty) graded for different levels. The test included items like.

At age 3 - Point out the nose, eyes and mouth.

At age 7 - Tell what is missing in the unfinished picture.

In 1931, the first American revision of the test was published by Terman at Stanford University and in 1937 another revision was carried on with the help of Maud A. Merril. This as well as 1960's revision is called Stanford - Binet Scale and widely used as an individual intelligence test. The tests in this scale are grouped in age levels, extending from age 2 to 22 years. The tasks to be formed by the subjects in these various tests range from simple manipulate to abstract reasoning.

Binet Tests have been adopted in India too. The first such attempt was made by Dr. C.H. Rice in 1922 when he published his "Hindustan Binet Performance Point Scale." This was an adaptation of the Binet test along with some performance tests. The State ManovigyanShala of Uttar Pradesh has made a Hindi version of Stanford Binet-test. This test is divided into several age groups and named as 'BudhiParikshaAnooshilan.'

The other common Verbal Individual Intelligence test (used in India) is Samanya BudhiPariksha. This test is an Indian adaptation of the well-known test of William Stephenson. It has been prepared by State Bureau of Education and Vocational Guidance, Gwalior (M.P.)

Individual Performance Tests

As said earlier, the complete non-verbal or non-language tests of intelligence for testing an individual at a time come into this classification. In these the contents and responses are in the form of performance and language is not used at all. In these tests the items which require responses in terms of motor activities are included. Generally the activities, on which the performance of an individual is tested, are of the following types :

(i) Block building or cube construction. Here the subject is asked to make a structure or design by means of blocks or cubes supplied to him. The examples of the tests involving such type of activities are Merril Palmer-Block Building ,Koh's Block Design Test, Alexander's Pass-along Test etc.

(ii) To fit the block in the holes. Test material of such types provides numerous blocks and a board in which there are holes corresponding to these blocks. The subject has to fit the blocks in these corresponding holes (in the board). Examples are Seguin Form Board Test and Goddard Form Board Test.

(iii) Tracing a maze. Test material consists of a series of mazes of increasing difficulty, each printed on a separate sheet, The subject is required to trace with pencil the path from entrance to exit.Porteus Maze Test is an example involving such type of activities.

(iv) Picture arrangement or picture completion. In picture arrangement test, the task is to arrange in series the given picture whereas in picture completion test, the subject is required to complete the pictures with the help of given pieces cut out of each picture. The Healy pictorial completion test is a good example of such test which provides a good estimate of the intelligence of the subject without making use of language.

As seen above, these tests try to emphasize upon one or the other types of performance.

Instead of using one or two tests, a group of performance test, organized either into a scale or battery, may be used for a comprehensive picture of an individual's mental ability. Some of the popular known scales are :

(i) The Pinter Patterson Scale.

(ii) The Arthur Point Scale.

(iii) Alexander's Battery of Performance Tests.

In India too, attempts for construction of such batteries have been made. Dr. Chander Mohan Bhatia's work in this regard deserves special mention. He has developed a battery of performance tests known as 'Bhatia's Battery of Performance Test'.

It contains the following five sub - tests :

(i) Koh's Block Design Test.

(ii) Alexander's Pass - along Test.

(iii) Pattern Drawing Test.

(iv) Immediate memory test for digits (with an alternative form suitable for illiterates).

(v) Picture Construction Test.

The last three tests in this battery have been constructed by Mr. Bhatia himself while the former two have been borrowed.

WECHSLER BELLEVUE INTELLIGENCE SCALE

This scale is available in two forms. While the WISC (Wechsler Intelligence Scale for Children) form is used for children, the WISA form is for adults. It is an individual test that has a unique quality of being named as verbal and performance scale simultaneously.

The scale consists of eleven sub -tests : six sub -tests make up a verbal scale and five performance scale. These tests are listed below in the order in which they are administered.

Verbal Scale :

1. Test of General information
2. Test of General comprehension
3. Test of Arithmetic reasoning
4. Test of distinction between similarities
5. Test of Digit span
6. Test of vocabulary Performance Scale
7. Digit symbol test
8. Picture completion test
9. Block Design test
10. Picture arrangement test
11. Object assembly test

The scores on these sub-tests are added to get an idea of an individual's intelligence.

Group Verbal Intelligence Tests

The tests, which necessitate the use of language and are applied to a group of individual at a time, come under this category. Some of the earlier tests belonging to this category are :

(i) Army Alpha Test (developed in World War)

(ii) Army General Classification Test (developed in second World War)

Today we have a large number of group verbal tests. In India too, attempts have been made to construct such tests. Some of the popular tests of this nature are -

1. C.I.E. verbal Group Test of Intelligence (Hindu) constructed by Prof Uday Shankar.
2. The Group Test of General Mental Ability (Samuhik Mansik YogyataPariksha) constructed by Dr. J.S. Jalota (Hindi)
3. Group test of Intelligence, prepared by Bureau of Psychology, Allahabad (Hindi).
4. Prayag Mehta's Group Intelligence Test (Samuhik Budhi Pariksha, Hindi). This test has been published by Mansyan, Delhi.
5. General Mental Abilities Test prepared by Dr. P.S. Hundal of Punjab University (Panjabi).
6. Group verbal intelligence test prepared by Dr. P.Gopala Pillai of the Kerala University (Malayalam)

7. Samuhik Budhi Pariksha (Hindi), prepared by Sh. P.L. Shrimali, VidyaBhavan G.S. Teacher College, Udaipur.

8. Samuhik Budhi Ki Jaanch (Hindi), prepared by Shri M.S. Mohsin, Educational and Vocational Guidance Bureau, Patna, Bihar.

The Group Non- Verbal Intelligence Tests

These tests do not necessitate the use of language and are applicable to a group of individuals at a given time.

The difference between performance test (used for an individual) and non-verbal tests (used for a group) is in the degree as far as their non - verbal nature is concerned. The performance test require the manipulation of concrete objects or materials supplied in the test by the subject. Responses are purely motor in character and seldom require the use of paper and pencil by the testee, (except in cases like Maze Test etc.) where as the test material used for group testing, is provided in booklet and requires the use of pencil by the testee.

Still in these tests, material does not contain words or numerical figures. It contains pictures, diagrams and geometrical figures etc. printed in a booklet. The subject is required to do such activities so as to fill in some empty spaces, draw some simple figures to point out similarities and dissimilarities etc. So, although the subject uses paper and pencil, he does not need to know words or numerical figures. What he has to do is explained clearly by the examiner usually through clear demonstrations so as to make the least possible use of language.

The examples of such type of tests are :

(i) Army Beta Test. It was developed during World war I, in U.S.A. for testing the intelligence of those soldiers who were either illiterate or were not used to English language.

(ii) Chicago Non -Verbal Test. This non-verbal test has proved most useful for young children aged between 12 and 13 years.

(iii) Raven's Progressive matrices Test. This test was developed in the U.K. It is a very popular non - verbal group test of intelligence. The test has been designed to evaluate the subjects ability-

a) to see relationship between geometric figures or designs.

(b) to perceive the structure of the design in order to select appropriate part of the competition of each pattern.

(iv) C.I.E Non - Verbal Group Test of Intelligence. Originally prepared by J.W. Jenkins, the test is printed by C.I.E for adaptation into Hindi medium schools.

Individual and group tests have their advantages as well as disadvantages. We can compare them on the following lines:

Individual Tests	*Group Tests*
1. With these tests, only one individual is tested at a time. They cannot be administered to a group and this makes them costly in terms of time, labour and money.	1. These tests have two - fold advantage. In addition to their applicability in testing a group of individual at a time, they can also be administered to the individuals separately. Testing of so many individuals at a time gives them the advantage of saving time, money and labour.
2. Individual tests have the unique advantage of being used for children as well as adults.	2. Group tests cannot be given to young children below 9 to 10 years of age.
3. As the examiner has a close contact with the subject, he can take into account all personal and emotional factors and like - wise have all those additional pieces of information which may prove useful for the interpretation of an individual's test scores.	3. The examiner does not have a desirable contact with the subject. He cannot detect and rectify influence of such factors as ill health, mood, poor social background or practice and coaching that might have been given to a subject for boosting his score. What the examiner gets at all is the numerical score and nothing of additional information as obtained in individual tests.
4, Individual tests are not as objective and standardized as group tests. Their administration require well-trained and competent examiners.	4. Group tests are more objective and standardized in comparison to individual tests. The manuals and instruction provided with these tests make their administration, scoring and interpretation so easy that a need of such trained personal is seldom felt.

VERBAL TESTS VS NON-VERBAL AND PERFORMANCE TESTS

What led to the construction of non-verbal and performance test when verbal tests were there for testing the intelligence, is a relevant question to be asked. Verbal tests, as already said, laid emphasis on linguistic ability. They were loaded with verbal material words and numerical. Hence those with linguistic superiority were always on the advantages side in comparison to those having language weakness. To do away

with such flaws non - verbal and performance tests put to use. In brief, the advantage of these tests over verbal tests are as under:

1. Performance tests are useful for those who have language handicap due to one or more of the following reasons:

i) They may belong to the foreign language speaking groups.

ii) They may be illiterates, not knowing how to read and write.

iii) They may have difficulties in reading, writing and listening due to defects in their sense organs (deaf, dumb etc.)

iv) They may be younger children who are not yet able to read and write well.

v) They may be mentally retarded or mentally deficient children and therefore, very slow in grasping and responding to the verbal items ,

vi) They may belong to unprivileged class or strata of the society and hence may have had limited education opportunities.

2. Verbal test belonging to one region contains the material when has a direct relationship with the language or culture of that region or country. Non-verbal and performance tests are more or less language and culture free and hence be used for cross - culture and linguistic study of intelligence.

3. They can prove useful in the efforts to determine aptitude and promise in shop work. mechanical jobs and so on.

LIMITATIONS OF NON-VERBAL AND PERFORMANCE TESTS

1. They may not be able to predict scholastic success in school as do the verbal tests simply because school work itself is predominantly verbal.

2. They, specially the performance tests, are very costly and pose difficulty in being transported from one place to another.

3. They are more susceptible to practice - effects and chance successes are more frequent than in the case of verbal tests.Therefore, they are less reliable than verbal tests.

4. These tests are limited in their range of mental functioning tested since they do not require much use of the ability to make abstractions and deal with concepts. They are thus not able to differentiate among above - average individuals.

Thus these are the merits and limitations of the tests. In fact, the testing of mental ability is a comprehensive task and cannot be solely left either to the verbal or performance tests. For taking a reliable view of a person's intellectual ability, following things should be kept in mind:

i) Performance test should be taken as a supplement to verbal tests and vice versa.
ii) No signal test or tests are suitable for this purpose.

3.4 Memorization: Definition, factors, LTM, STM and Causes of forgetting

Concept:

Memory is the faculty of the mind by which information is encoded, stored, and retrieved. Memory is vital to experiences and related to limbic systems, it is the retention of information over time for the purpose of influencing future action.' If we could not remember past events, we could not learn or develop language, relationships, or personal identity (Eysenck, 2012).

Often memory is understood as an informational processing system with explicit and implicit functioning that is made up of a sensory processor, short-term (or working) memory, and long-term memory (Baddely, 2007). This can be related to the neuron. The sensory processor allows information from the outside world to be sensed in the form of chemical and physical stimuli and attended to with various levels of focus and intent. Working memory serves as an encoding and retrieval processor. Information in the form of stimuli is encoded in accordance with explicit or implicit functions by the working memory processor. The working memory also retrieves information from previously stored material. Finally, the function of long-term memory is to store data through various categorical models or systems (Baddely, 2007).

Learning plays a significant role in all the walks of human life. All our attempts in the field of education are directed to make the pupil learn properly. But if we just learn to recall in a desirable way in a particular situation without being able to repeat that successfully on subsequent occasions, learning is of no avail. This means that for an effective learning, it is essential that we should be able to preserve our past experience and learning and make use of them whenever needed. In the psychological word this ability of retention and repeating is known as 'Memory'.

The three different stages of memory process are:

1. Encoding
2. Storage

3. Retrieval

Encoding refers to a process to translate or convert the sensory information (the thing of the environment we want to have in our memory) into such a coded form that can be easily stored and reproduced at the time of our need. The process of encoding as we can visualize resembles the stage of learning described earlier for the process of memorization. During the process of learning we try to encode the learned material or acquired experiences according to our own ability, style, experience, training or capacity. Every bit of this information can thus be transformed in the form of engrams and codes for the storage and its further retrieval. When we have proper encoding of the learned material, the results in terms of its storage and retrieval in proportion are always better. One can opt for any form, method or technique for choosing a particular code for any type of the information to be coded in one's memory like figure, symbol, word, sentence, incidence etc.

Definition;

Scout

Memory is the ideal revival so far as ideal revival is merely reproductive...This productive aspect of ideal revival requires the object of past experiences to be reinstated as far as possible in the order and manner of their original occurrence. (1938, p. 521)

Woodworth and Marquis

Memory consists in remembering what has previously been learned. (1948, p. 542).

Ryburn

The power that we have to 'store' our experiences, and to bring them into the field of consciousness sometime after the experiences have occurred, is termed memory. (1956, p. 220)

In this way, memory is regarded as a special ability of our mind to conserve or store what has been previously learned or experienced for being recollected or reproduced after some time.It must also be clearly understood that memory does not merely consist of reproducing or recollecting previous experience or learning as most of us usually understand it. It is a complex process which involves all the four factors mentioned above namely, learning, retention, recall and recognition. Therefore, when we say that a person has a good memory we mean that he has an ability to learn something easily, retain it for a long time, recognize and recall it accurately with

rapidity and lastly to make proper use of his previous learning or experiences. A good memory should be serviceable. We must be able to recognize, recall and recollect the relevant ideas, things or persons at the proper time. Then and only our learning and retention will be of any value and we would be making proper use of our power of memorization or remembering.

TYPES OF MEMORY

Psychologists have tried to classify memory into certain types according to their nature and purposes served. The broad classification consists of immediate memory, short - term memory and long - term memory. Let us see what we mean by these types.

Sensory or Immediate Memory

Immediate memory or sensory memory is that memory which help an individual to recall something immediately after having perceived it. In such type of memory, retention time is extremely brief, generally from a fraction of a second to several seconds. Old sensory impressions disappeared as they are 'erased' by new information.

Immediate memory is needed when we want to remember a thing only for a very short period of time. Like we enter the cinema hall and see the seat number given on our ticket. After occupying the seat, we forget the seat number. We look up a telephone number from the directory and remember it. But after making the call, we usually forget it. In all such cases, immediate memory is needed to help us learn a thing immediately with speed and accuracy, remembering it for a short time and forgetting it rapidly after use.

Short - Term Memory

As the name suggests, this type of memory is also temporary and short - lived like the immediate memory. Its impressions do not disappear or erase quickly like sparks of the lighting or waves of the sea as happens in the case of immediate memory. The distinction between these two types of memory can be properly understood through the comparison given in the table ahead.

Immediate Memory	*Short - Term Memory*
1. The retention time is less than one second. In special circumstances, it can go up to two seconds for the visual stimuli and four to five seconds for the auditory stimulus.	1. Its duration is longer. The information temporary stored up in short-time memory may endure as long as 30 seconds or so, even if the material is not being rehearsed.
2. The sensory impression in the form of engrams in the brain disappear or decay in no time like the waves in the sea. Any type of rehearsal, practice or deliberations on the part of the learner can't help in their further retention.	2. The period of retention here can be extended to quite a longer duration as a result of the proper efforts and rehearsal by the learner.
3. Span of immediate memory is generally more than the short-term memory. One can have a retention of 11 to 16 items in one's immediate memory for at least half a second in the form of visual images and hearing echo etc.	3. The span of short-term memory is shorter than the immediate memory. Generally, five to nine items (the magical number, seven plus or minus two) can be held in short - term memory at one time. However, one can retain much information in one's short memory by special process like chunking (grouping information through coding). As a result one can remember a phone number 143254376 by grouping under three heads ; 143, 254, 376.
4. The sensory impression in the immediate memory are either immediately erased or transferred in the short-term memory.	4. The sensory information stored in the short-term memory are lost in a short period if they are not subject to repetition or rehearsal. Proper deliberate attempts and rehearsals can help in transferring them into long - term memory.
5. The sensory information is preserved and retained in this type of memory in the form and shape as it was originally received.	5. The sensory information is subject to process of encoding for being retained in short-term memory in the form of special visual and auditory impression, symbols, signs, words etc.
6. Forgetting is quite rapid in the case of immediate memory. Here the sensory impression have quite a temporary retention resulting in their rapid forgetting.	6. In this memory, there is natural as well as deliberate forgetting. Here one can deliberately erase the old impression for making space for the new ones.

Long - Term Memory

At the name suggests, long - term memory has quite a durable or endless retention of the sensory impressions. That is why, it is also referred to as permanent memory. In addition to its long duration of retention, it has a seemingly limitless capacity to store information. In this way the span of retention is far greater than the short - term or immediate memory. The sensory impression stored in long-term memory are subjected to very little or no decay and requires little, if any, rehearsal for their lengthy and effective retention.On account of its such nature and characteristics, it is the only memory that is our best friend and help us to remember a number of limitless things on a relatively permanent basis. Remembering our identifying data like our name, father's name, date of birth, date of marriage etc. is the simplest example of our long-term memory. With the help of our long - term memory, we can store, retain and remember at record notice most of the things of our lives and can thus making things in our life quite easy.

The most important thing attached to the long-term memory is related with its uniqueness in encoding the received sensory information in a properly organized and systematic way. The codes are properly selected in relation to the meaning, patterns and other characteristics of the received sensory information. This coded language is quite methodical, carries in all its way a distinctive meaning, purposeful understanding for the individual to carry out its storage and timely revival.

The sensory impression, encoded in the long - term memory are mainly of two types -Episodic and Semantic. The table given below depicts difference between STM & LTM:

Short - Term Memory (STM)	Long - Term Memory(LTM)
1. The duration is short. Generally it does not exceed 30 seconds.	1. The duration is quite long and enduring. It is not limited to some hours, days or years and thus may cover the entire life period of an individual.
2. The memory span is quite short and limited. Generally five to nine items can be held in one's short- term memory.	2. The span is quite wide and comprehensive. It has a seemingly limitless capacity to store any type of information.
3. There is no automatic rehearsal of the stored information in one's brain. So the memory traces are faded or erased very soon.	3. Here the memory traces undergo very little or almost no delay and requires little, if any, rehearsal for being permanently present in one's memory.

Short - Term Memory (STM)	Long - Term Memory(LTM)
4. Encoding process is defective. No rules or principles are followed for the proper up keeping of the collected sensory information. In fact the encoding is performed quite haphazardly without any consideration of the organizational characteristics and principles.	4. Encoding process in the long-term memory is quite structured, planned and organized. Here encoding of the information is performed according to well - thought meaning, pattern and other organizational characteristics. In this way, the sensory information is stored in a proper way for keeping them safe and alive to the limitless period.
5. The things and material in one's short-term memory is quite short - lived. It disappears soon if not subjected (frequently and repeatedly) to adequate practice and rehearsal. So, this memory is characterized by a rapid rate of forgetting the learnt material.	5. Complete forgetfulness is almost absent in the long-term memory. The things and material learnt are permanently retained in the long - term memory stores. From there it never disappears. An individual may feel some difficulty in recollecting the things stored but by conscious or unconscious efforts, he always gets success in its desired retrieval.
6. The short - term memory can be transformed into a long-term memory in case one deliberately tries in this direction by properly practicising, revising and rehearsing the learned material or things.	6. There is no such transfer of the retained material or experiences in one's long-term memory to any other type or memory.
7. The disappearance or erasing of the memory traces in quite a little time, provides early opportunity for the arrival of the new sensory experiences by saying goodbye to the older ones. Thus, process of receiving the new and erasing the old runs quite rapidly in the short-term memory.	7. Long-term memory does not show such speed of remembering the new and forgetting the old sensory experiences. Here forgetting is quite minimum or say quite negligible. In this case, one does not need to erase the old impression for providing accommodation to the new ones.

FACTORS INFLUENCING MEMORY

Various factors like internal as well as external, may be responsible for affecting, influencing and controlling one's memory and its process. In the internal factors, we may include all those things that lie within the individual and for these factors he is himself responsible in terms of the processes and products of memorization. These may be named as physical or mental health or state of his body and mind, his will power, the nature of his attitude, aptitude and interest regarding the learned material, his status regarding the growth and development in various personality dimensions like physical, mental, social, moral, emotional and aesthetic etc. and his level of adjustment to his self and the environment and so on. Among the external factors, we may include all those factors lying outside the person in his environment that may influence the process and products of his memorization. In addition to all these internal and external factors influencing one's memory, there is a third type of factor or element that is specifically associated with the learning material. This factor generally falls in the following two types or categories.

A. Nature of the material to be memorized.

B. Methods and techniques adopted for memorization.

Nature of the Material to be Memorized

The nature of the material, which is to be learned or memorized, carries a lot of weight in influencing the process and products of memorization.

Regarding the nature of the learning material, two of its components or characteristics - its purposefulness and amount - are said to be a great deciding factor the good or poor results of one's efforts towards memorization. Let us think over these attributes of the learning material.

MEASURES AND TECHNIQUES FOR EFFECTIVE MEMORISATION

The following techniques and measures may be adopted for obtaining better results in the process of memorisation (leaning, retention and its reproduction).

1. Will and determination. There must be firm determination or strong will to learn, retain and reproduction for achieving the desired success in memorization. Where there is a will there is a way. Materials read, heard or seen without intention or mood are difficult to be remembered at later times.

2. Interest and attention. Interest as well as close attention are essential for effective learning and memorization. One who has no interest in what one learns, cannot give

due attention to it and consequently will not be able to learn it. H.R. Bhatia emphasizes this fact in the following words :

Interest is the mother of attention and attention is the mother of memory: if you would secure memory, you must first catch the mother and the grandmother (1964, p. 94)

Therefore, every care should be taken to create the desired interest in the material by making its purpose clear and linking it with one's natural instincts and urges. Again all the factors causing distraction should be reduced to the minimum so that full attention can be paid to the material in hand.

3. Adopting proper methods of memorization. There are so many economical methods of memorization but all are not suitable on all occasions for all individuals.Therefore, a judicious selection should be made in choosing a particular method in a given situation.

4. To follow principle of Association. It is always good to follow the principle of association in learning. A thing should never be learnt in a complete watertight compartment. Attempts should be made to connect it with one's previous learning on one hand with so many related things on the other. Sometimes for association of ideas special techniques and devices are used that facilitate learning and recall. The letter VIBGYOR has proved to be effective in remembering the colours of the spectrum.Similarly, many associations may be formed so that the material can be learned and easily remembered.

Remembering and Forgetting

One of the aims of school instruction is to expand the knowledge of learners. The teacher's responsibility is to encourage the learners to acquire and to retain the knowledge imparted in school for future use in meeting life problems. But to out great surprise we find that students forget most of the school learning after a short lapse of time. The basic questions is, why do we forget ? In this chapter we will examine the causes of forgetting and the various techniques which can be used by classroom teachers to minimize the percentage of forgetting and to make the process of acquisition of knowledge more efficient and lasting for the students.Traditionally, we hold that we learn by practice and forget because we fail to practice. This common view has been recently challenged by experimental psychologists. Forgetting occurs only when some learning takes place. If there is no learning, then there is no forgetting. It is incorrect to say of forgetting anything that was never learned. Forgetting is an inevitable concomitant of learning.Thus, failure to learn is one of the most common

reasons why students are unable to recall answers to examination questions. As a matter of fact learning requires active rehearsal of what is to be learned. It means recalling relevant information, grasping fundamental principles that underlie a learning task and memorizing key facts.

On the basis of empirical studies conducted on forgetting by psychologists, six different explanations have been given as the causes of forgetting. In the following pages, we will examine the approaches to the problem of forgetting.

1. THEORY OF (DECAY)

It is a common view that forgetting is a process of fading with the passage of time. It is believed by many people that forgetting is produced by time factor. According to this view, impressions created by learning in the cortex fade away as the time passes. This widely held view is called the theory of discuss or decay. The theory has been substantiated by experimental evidences. In our daily life we have a wealth of experiences which fade away with the passage of time. We meet a man and forget his name after some time. We can hardly recall what we had for dinner two days back. All of these experiences support the idea that learned material decays time. But there are certain facts which require close examination of this old view.

First, if the claim that disuse or decay only operates to produce inability to recall, it means that any length of time that elapses between the learning of facts and recalling them should produce some loss in memory. But this claim has been disproved by the phenomenon of spontaneous recovery in conditioning. Retention actually improves following a brief time -interval of a conditioned response of no practice.

Second, instances of excellent retention, following the passage of long time intervals, are present in numerous activities of our life as skating, swimming and cycling. Some skills appear capable of resisting the so-called dissipating effects of time factor.

The two evidences, cited above, seem inconsistent with the theory of disuse or decay. They direct our attention to another factor that may play an important role in forgetting. Perhaps it is not time itself but rather what happens between learning and recall that is an important factor which influences retention. The quality and quantity of memory will largely depend on what the learner does while he is having the experience and what kind of experiences follow.

Summarizing we can say that the theory of decay is an old and venerable one but it has been neither proven nor disproven, because we cannot find a way to prove that it does.

2. THEORY OF INTERFERENCE

Psychologists once were of the opinion that forgetting is caused by disuse and fading of impressions with the passage of time but the phenomenon of spontaneous recovery in conditioning and everlasting memory of some motor skills have proved the belief incorrect. Psychologists have recognized the influence of intervening activities. The interference may be of two types :

(a) retroactive inhibition, and

(b) proactive inhibition.

Retroactive inhibition means that something works backward to block something else. The interference or interaction between old and new learning is an important variable that influences retention. In proactive inhibition previous learning interferes the recall of present learning. We will describe the mechanisms of these two types of inhibitions in the following paragraphs :

(a) Retroactive inhibition. The relation between intervening activities and retention has been systematically investigated by psychologists in transfer of training experiments, what is technically known as retroactive inhibition. In the common transfer of training experiment the subject learns one task (B) to see how this affects recall of another task (A). The experimental design to study retroactive inhibition is given below :

Group	Original learning	Activity interpolated	Test
1. Experimental	Learn A	Learn B	Recall A
2. Control	Learn A	Unrelated activity	Recall A

The results of experimental studies conducted by psychologists on retroactive inhibition show that typically the experimental group is poor in recall of A. It has been further established that more similar the interpolated activity B is to the original learning A, the less the amount recalled, the greater is the retroactive inhibition. Interference between the items of the original and the interpolated list at the time of the recall is an important variable influencing the amount of retroactive inhibition. The more similar the two lists are, greater will be the amount of forgetting.

(b) Proactive inhibition.Proactive inhibition is a phenomenon closely related to retroactive inhibition. Experiment design for studying proactive inhibition is given as under :

Group	Preceding activity	Original learning	Test
1. Experimental	Learn B	Learn A	Recall A
2. Control	Unrelated activity	Learn A	Recall A

The design of proactive inhibition differs from retroactive inhibition in that the experimental group learns B before, instead of after A. Whereas B was a task interpolated between the learning and the recall of A in the retroactive inhibition experiment, B is a task preceding the learning of A in the proactive inhibition study. To evaluate effects upon the experimental group of learning B prior to A, the control group relaxes during the time, when experimental group learns B. Forgetting is more due to proactive inhibition. Our ability to recall what we learn is reduced by the experiences by have learned previously.

3. TRACE - CHANGE THEORY

Tree - change theory of forgetting grows from research on perception. It has provided evidence that one's memory of what he has seen tends to change in specific ways. For example, if an S is shown in any of the original figures given below, his memory of them will shift to the more symmetrical and less imperfect figures shown in the columns on the far right.

If we examine the above figures we find that each change is brought about by a different principle, closure, good figure and symmetry. These three principles are seen as physiological principles that are built in respect of the functioning of brain tissues. According to these principles, the trace laid down by an original experience becomes a more perfect and better balanced figure, thereby losing some of its qualities. This change in the trace causes us to forget the original figure.Forgetting, according to this theory, is attributed to change in traces in the brain.

4. FORGETTING AS RETRIEVAL FAILURE

We experience in our daily life that sometimes we want to recall name of a friend or some piece of information. We fail to recall that information at that time but when conditions were different, the name or information comes back more or less spontaneously. This phenomenon is called TOT (tip -of- the - tongue). Tip -of- the - tongue shows how non - availability of appropriate cues hinders retention. According to this approach,. forgetting is very often a temporary rather than a permanent phenomenon. Some psychologists have claimed that forgetting is not like losing

something but rather is more like being unable to find it. When cues that were present at the time of learning are not available at the time of recall, retention suffers.It stimulus terms are altered, recall will be reduced (Yum). Forgetting occurs because of failure in the mechanism responsible for remembering.

5. MOTIVATION AND FORGETTING

Memories that would cause unhappiness or suffering if brought to mind are often forgotten. Most of us have but the haziest recollection of painful insults, threats to our lives, highway collisions and other such experiences. Remembering can be considered an instrument act. You can obtain reinforcement when you can remember the answer to an examination question. What most people have not noticed is that a person can obtain reinforcement for forgetting. Forgetting can function as an instrument act.

Freud was the first person who emphasized the influence of motives upon retention. He used the term repression to describe the tendency to avoid remembering anything associated with fear or unpleasantness of any kind. In military, forgetting called amnesia that appears in soldiers is selective. They are unable to recall any detail of certain combat experiences.Generally, it has been seen that soldiers forget experiences which they are ashamed of.

An experiment conducted by Zeigarnik (1927) explains how motivation can influence retention. He compared the recall of completed and incompleted task. Subjects were allowed to complete certain interesting tasks and they were forced to abandon others just when they had been most absorbed in them, when they had finally got the hang of things and felt success was near. At the end of the experimental session, the subjects were asked to list each task, they had worked on. They could recall incompleted tasks than completed ones. The explanation of recalling incompleted task is that in case of completed tasks their motivation was satisfied and in the case of incomplete tasks, the attraction of those tasks they were unable to finish remained.

6. CONSOLIDATION THEORY AND RETROGRADE

Amnesia

Consolidation theory is a new explanation of forgetting. It emphasizes the importance of undisturbed period for memory traces to become durable and permanent. If the newly formed traces are distributed and no time is given for consolidation, they will be wiped out. The memory traces, like cement, take time to harden. Retrograde

amnesia or backward forgetting supports the consolidation theory. Human beings who suffer brain injuries display retrograde amnesia. They cannot remember what happened just before the accident even though their memory of the distant past is normal. It means that the accident disrupts immediate memories before they have a chance to consolidate.

7. Gardener's Theory of Multiple Intelligences

Howard Gardner was the first to see the limits of the old way of thinking about intelligence. In his book Frames of Mind published in 1983, he proposed that there was not one, monolithic kind of intelligence, that was crucial for success, but rather a wide spectrum of intelligences with seven key varieties. His list includes two standard academic kinds i.e. 'verbal' and 'mathematical logical alacrity' ; it also includes 'spatial capacity' often seen in an outstanding artist or architect; the 'kinesthetic genius' displayed in physical fluidity ; the 'musical or rhythmical' ; the 'personal intelligence' ; 'interpersonal skills' ; and 'intrapsychic capacity'.

Gardner acknowledges that seven is an arbitrary figure. For the variety of intelligences, there is no magic number to the multiplicity of human talents. At one point of time, Gardner have given twenty different varieties of intelligence. Interpersonal intelligence broke down into four distinct abilities.i.e., leadership, the ability to nurture relationships and keep friends, the ability to resolve conflicts and the skill of social analysis.

Gardner's thinking about the multiplicity of intelligence continued to evolve. In 1993, he gave the summary of personal intelligences as :

"Interpersonal intelligence is the ability to understand other people : what motivates them, how they work, how to work cooperatively with them. Successful politicians, social workers, teachers, clinicians, religious leaders and sales people are individuals who have high interpersonal intelligence. Interpersonal intelligence is a correlative ability, turned inward. It is the capacity to form an accurate ,verdical model of oneself and to be able to use this model to operate effectively in life."

According to Gardner, the core of interpersonal intelligence includes the "capacity to recognize and respond appropriately to moods, temperaments, motivations and desires of other people". In interpersonal intelligence, he included 'access to one's own feelings and the ability to discriminate among them and draw upon them to guide behaviour'.

The theory of multiple intelligence has evolved to focus on meta cognition - that

is, awareness of one's own mental possesses - rather than on the full range of emotional abilities. Gardner pointed out that many people with I.Q. of 160 work for people with I.Q. of 100, if the former have poor interpersonal intelligence and the latter have a high one. The multifaceted view of intelligence offers a richer picture of child's ability and potential for success than standard I.Q.

3.5 CONCEPT OF CREATIVITY

The real nature and concept of creativity may be properly explained by emphasizing on its following aspects.

— Its meaning & definition

— Its nature and characteristics.

Meaning and Definition of Creativity

The term 'creativity' or 'creative process' has been defined by some eminent scholars in the following different ways :

Stranger and Karwoski

Creativity is the capacity of a person to produce compositions, products or ideas which are essentially new or novel and previously unknown to the producer. (1956, p. 22)

Wilson, Guilford and Christensen

The creative process is any process by which something new is produced - an idea or an object including a new form or arrangement of old elements. The new creation must contribute to the solution of some problem.(Dutt, N.K., 1974, p. 208)

Skinner

Creative thinking means that the prediction and / or inferences for the individual are new, original, ingenious, unusual. The creative thinker is one who explores new areas and makes new observations, new predictions, new inferences. (1968, p.529)

If we try to analyze the above definitions we would find that the creation or discovery of something new is the central element in all these definitions.Therefore, we can easily conclude that creativity is the capacity or ability of an individual to create, discover or produce a new idea or object including the re-arrangement or reshaping of what is already known to him.

Nature and Characteristics of Creativity

On the basis of the above mentioned definitions as well as the findings of various other scholars, the nature and characteristics of creativity or creative expression can be summarized as follows :

1. Creativity is universal.Everyone of us possesses creative capacity to some degree.

2. Although creative abilities are natural endowments, they are capable of being nourished and nurtured by training or education.

3. Through creative expression, something new or novel is produced. But novelty or newness does not necessarily imply to produce a totally new idea or an object which has never been experienced or produced earlier. To make the fresh and noble combination for the given separate elements or to reshape or rearrange the already known facts or principles or to bring a slight reform and modification in the previously known techniques, are as much the acts or creative expression as the discovery of a new element in chemistry or a new formula in mathematics. The only precaution for naming an expression as creative is that it should not be a mere repetition or reproduction of what has already been experienced or learned by an individual.

4. Any creative expression is the source of joy and satisfaction for the creator. The creator says what he sees or feels in his own way. There is perfect individuality in one's creative expression. He expresses himself, to a great extent, through his creation. It is his own way of looking at things ; persons or events and therefore, it is not essential that a creative work may arouse the same feeling or give same satisfaction as experienced by the creator himself.

5. The creator is the person who is able to make ego - involved statements like, "It is my creation', 'I have solved this problem.' 'It is my ideas ,' etc. In creative expressions there is complete ego involvement.

6. Creative thinking cannot be a closed thinking. It must have complete freedom for the multiplicity of responses, choices and lines of action.

7. The field of creative expression is very wide. It covers all the aspects of human accomplishment like scientific inventions and discoveries, composition of poems, writing of stories and drama and good performance in the fields of dance, music, painting, sculpture, political and social leadership, business, teaching and other professions. Our day -to - day life activities also need creativity.Therefore, in a nutshell, life as a whole present enormous opportunities for creative expression.

The question as to what different cognitive factors constitute creativity has been a subject of excessive experiment, action and research. J.P. Guilford, Torrance,

Drevadahl and others have tried to identify the important components of creativity. As a result, ideational fluency, originality, flexibility, divergent thinking, persistence, self - confidence, sensitiveness, ability to see relationships and make associations are some of the factors that are found favourable for creative output.

CREATIVITY IN CHILDREN

Identification of Creative Children

The term 'creativity' cannot be used synonymously with giftedness. Therefore, we should not make a mistake of considering every gifted child as a creative child. Creativity in its all shapes and forms is the highest expression of giftedness that may or may not be found in a particular gifted child. The problem then lies in the identification of the creative children.

Creative behaviour and expression, like other behaviour patterns, possesses its basic components in the form of cognitive, conative and affective behaviour. Consequently, we can label a child creative to the extent to which he is able to demonstrate creative aspect in his thinking ,feeling and doing behaviour. For such labeling, we may employ two different approaches :

(i) making use of tests of creativity, and

(ii) making use of non-testing devices observation, interview, rating scale, personality inventory, check - list etc. Let us discuss these approaches one by one.

CREATIVITY TESTS

As we make use of intelligence tests to label a child as intelligent, we have the use of creativity tests for labeling a child as creative. There are so many tests available in India and abroad for this purpose. We are mentioning a few of these tests below.

Tests Standardized Abroad

1. Minnesota tests of creative thinking.
2. Guilford's Divergent Thinking Instrument
3. Remote Associate Test.
4. Wallach and Kogan Creativity Instrument.
5. A.C. Tests of Creative Ability.
6. Torrance Tests of Creative Thinking.

Tests Standardized in India

1. Baquer Mehdi's Tests of Creative Thinking - Hindi and English.

2. Passi's Tests of Creativity.

3. Sharma's Divergent Production Abilities Test.

4. Saxena's Tests of Creativity.

As pointed out earlier, creativity is a complex blend of a number of abilities and traits. Therefore, in all the creative tests, attempts are always made for the assessment of these abilities and traits with the help of verbal and non-verbal test items. The factors or dimensions commonly measured through these tests are fluency, flexibility, originality, divergent thinking and elaboration. Let us now illustrate the measurement of creativity components with the help of two creativity tests - one standardized abroad and the other in India. Torrance Tests of Creative Thinking. It is a set of two tests - one verbal and the other non - verbal. It has been developed by the famous American psychologist E. Paul Torrance and can be employed to test the creativity of the children from Kindergarten to graduation.

For testing the creativity through non - verbal and verbal performance. Torrance has thus developed figural form A and B and verbal form A and B (Forms B are the equivalent alternatives of the forms A).

The figural form (Non verbal testing device). The activities required in this test are of the non - verbal nature. The subject has to perform certain non -verbal activities, i.e. draw or make something as a response to the test items. This test has three sub-tests as described below:

(i) Figure or picture completion test. In this sub-test, there are some incomplete figures. The subject is asked to complete these figures in whatever way he desires. (ii) Picture or figural construction test. In this sub-test, the subject in provided with a piece of coloured paper cut in a curved shape and asked to think of a figure or picture of which this piece or paper may be a part.

(iii) Parallel lines test: In this sub-test, there are several pairs of straight lines. The subject is required to draw as many objects or pictures by using such pair.

The verbal forms (used as a verbal testing device). Through the items of the sub - tests of this form, the subject is required to provide written responses. There are six sub - tests incorporating activities of the following nature.

(i) Asking type : Here the subject is encouraged to reveal his ability to perceive all things that are not normally perceived by others.

(ii) Guess cause and guess consequences type : Here the subject is encouraged to

reveal his ability to formulate hypotheses concerning cause and effect, i.e. what is behind the situation in the picture and what its consequence may be.

(iii) Product Improvement Type : The subject are asked to suggest ways and means to improve a toy, a machine or such other products.

(iv) Unusual Use Type : These are meant to test the divergence about the ways of using a product. Here the subjects have to tell about as many unusual uses as they can point out to use a product.

(v) Unusual Questions Type : Here for a particular object or verbal description, the subjects are required to ask as many unusual questions as they can.

(vi) Just Suppose Type : The subjects are required to predict outcomes of unusual situations.

The responses of the subject are scored in all the sub-test items of both the forms (figural and verbal) and then his total score is computed for providing an estimate of his overall creative potential.

Baquer Mehdi's Tests of Creativity. This test has been developed by Dr. Baquer Mehdi. It has been published by National Psychological Corporation, Agra. There are four verbal and three non-verbal sub-tests under this. This verbal form has the following four sub - tests :

1. Consequence Test (duration 12 minutes). In this test, the subject is asked to think of as many consequences as possible for situation like -

1. What would happen if we could fly like a bird.

2. What would have happened of your school has wheels ?

3. What would happen if you do not have any need for food ?

2. Unusual uses test (duration 15 minutes). It includes test items like - Write as many novel, interesting and unusual uses for objects like a piece of stone, a wooden stick, water.

3. New relationship test (duration 15 minutes). It has the test items like below.

Think of as many relationships between the following pairs of words, as possible. (i) Tree, house, (ii) Chair, ladder, (iii) Air, water.

4. Product improvement test (duration 6 minutes). It consists of test items like below.

Non-verbal Sub- tests : The two sub-tests of this category are of the following types:

(i) Line figure completion test (duration 15 minutes). Below in Fig; here are 10 incomplete line drawing. You have to draw meaningful and interesting pictures using each of them.

Also give an appropriate title for each of your creation.

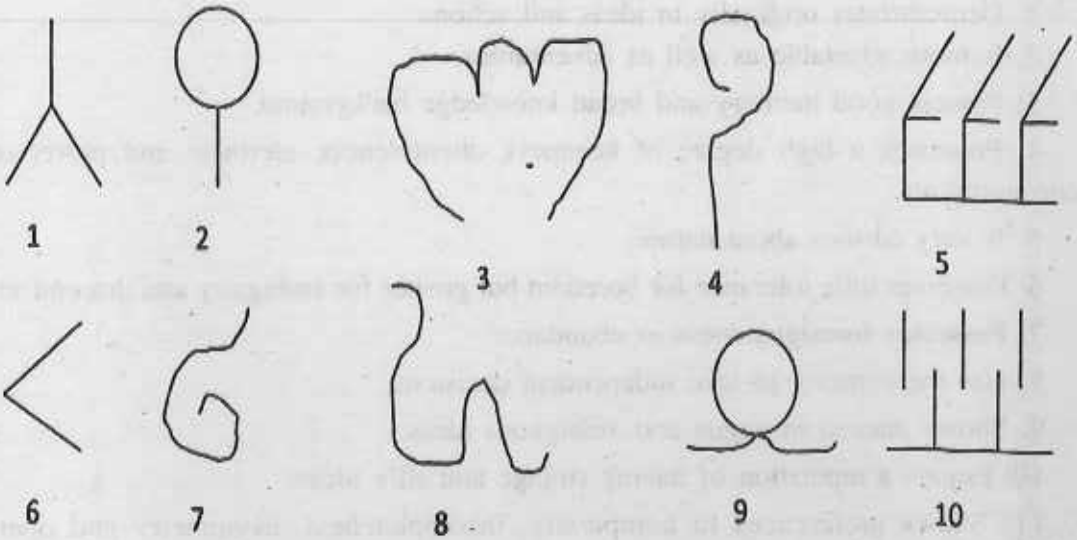

Fig. Line figure completion test.

(ii) Picture construction test (duration 10 minutes). Here there are seven triangles and seven ellipse. Construct different meaningful and interesting pictures by using these figures in multiple associations.

In all such creativity tests as illustrated above, the verbal and non-verbal activities are evaluated in terms of related creative abilities like fluency, originally, flexibility and elaboration. A high score of this creative test increase the probability of declaring the subject as creative.However, such declaration may need further support from the results of the assessment made through some other testing devices.

USE OF NON - TESTING DEVICES

The creative aspect of a child can also be accessed through some non-testing devices like Natural observation method. Situational techniques, Rating scale, Check list, Interview, Personality inventories, Interest inventories ,

Attitude test, Aptitude test, Value schedules and Projective techniques, and so on. These devices help in the revelation of those personality traits and behavioural characteristics that are supported to be present in a creative child. Some of these traits or characteristics, as identified by the research workers in the field of creativity, are mentioned below.

Personality and Behavioural Characteristics of a Creative Child

1. Demonstrates originally in ideas and actions.
2. Is more adaptable as well as adventurous.
3. Possess good memory and broad knowledge background.
4. Possesses a high degree of keenness, attentiveness, alertness and power of concentration.
5. Is very curious about nature.
6. Possesses little tolerance for boredom but greater for ambiguity and discomfort.
7. Possesses foresightedness in abundance.
8. Has the capacity to take independent decisions.
9. Shows interest in vague and ambiguous ideas.
10. Enjoys a reputation of having strange and silly ideas.
11. Shows preferences to complexity, incompleteness, asymmetry and open mindedness.
12. Possess a high degree of sensitivity toward problems.
13. Can express his ideas as fluency as possible.
14. Shows flexibility in his thinking, feeling and doing behaviour.
15. Demonstrates the ability to transfer learning or training from one situation to another.
16. Demonstrates very rich imagination characterized as 'creative imagination'.
17. Is divergent and diversified in his thinking that is convergent and stereotyped.
18. Possesses ability to elaborate, i.e. to work out the details of a plan, idea or outline.
19. Is not frightened by the unknown, the mysterious and the puzzling and on the contrary is often attracted towards it.
20. Welcomes novelty of designs or new solution to a problem, gets enthused and suggests other ideas.

21. Demonstrates the ability to experience self as creative and the originator of one's act and takes pride in one's own creation.

22. Has more of him available for use and employment in creative purposes rather than wasting his time and energy protecting him against his self.

23. Possesses high aesthetic values and good aesthetic judgement.

24. Possesses a high degree of the feeling of self- respect and is self- disciplined, sensitive and intolerant towards injustice.On account of these qualities, is often misunderstood and evaluated disobedient, rebellious and mischief monger.

25. Demonstrates human playfulness, lack of rigidity and relaxation in his behaviour and products.

26. Is always alive to his obligations.

27. Possesses the ability to accept tentativeness and ability to tolerance and integrate the opposites.

28. Has a richer fantasy life and greater involvement in daydreaming.

29. Shows different brain patterns than the less creative, especially during creative activity.

30. Pays respect to others' opinion and welcomes disagreement to his own suggestions.

31. Is always found to be more spontaneous and expressive.

Methods of Developing Creativity among Children:

Creativity, as a natural endowment, needs stimulation and nourishment. Most of the creative talent, if not given proper training, education and opportunities for creative expression, results in wastage. Moreover, creativity, as we have emphasized earlier, is universal. It is not the monopoly of a few geniuses only, every one of us, to a certain degree, possesses creative abilities. In a democratic set up like ours, it is not only the geniuses who are needed to create, manifest and produce. Others, whether mediocre or below average, are also required to think constructively and creatively.

Therefore, it becomes essential for the teachers as well as parents to realize the need of providing proper environment and creating conditions for complete growth and development of the creative abilities of children. The problem is vital, but there is a solution. It lies in the proper stimulation and nurturing of the abilities that seem related to develop creativity.Originality, flexibility, ideational fluency, divergent thinking, self confidence, persistence, sensitiveness, ability to see relationship and

make association etc. are some of the abilities that are attached to creative output, The following few suggestions can work satisfactory in the stimulation and nourishment of these abilities.

FREEDOM TO RESPOND

Most often we, teachers and parents, expect a routine type fixed response from our children and thus kill the very creative spark by breeding conformity and passivity. Therefore, we should allow adequate freedom to our children in responding to a situation. They should be encouraged to think about as many ideas as they may for the solution of a problem. Also we must let them have their own way when they strongly need a particular sort of novel expression.

OPPORTUNITY FOR EGO INVOLVEMENT

The feeling like "It is my creation", "I have solved it", give much satisfaction to children. Actually they can only be expected to put their determined efforts in creative activities when their ego is involved i.e. when they feel that a particular creative work stands on account of their efforts. Therefore, we should provide opportunities for children to derive satisfaction from being a cause.

ENCOURAGING ORIGINALITY AND FLEXIBILITY

Originality on the part of children in any form should be encouraged. Constant submission to the facts, unadulterated copying, passive reception, rote - memorization discourage creative expression and therefore, it should be checked as far as possible. In solving a problem or learning a task if they need to change their methods of learning or solving the problem, they should essentially be encouraged to do it. Adequate training can also be given by making them answer the problems like :

How would you dig the earth if you don't have a spade ? Or how would you draw an angel if you do not have proper instrument for drawing it ? Or how would you cross a river if there is no bridge over it ?

REMOVAL OF HESITATION AND FEAR

Most of the time (particularly in countries like ours where there is too much inferiority complex) there is a great hesitation mixed with a sense of inferiority and fear in taking initiative for a creative expression. We, generally, listen to the comments like "I know what I mean, but cannot write or speak before others." The causes of such

hesitation and fear should be discovered and removed as far as possible. The teachers and parents should persuade such children to say or write something, anything, no matter how crude it may be.

PROVIDING APPROPRIATE OPPORTUNITIES AND ATMOSPHERE FOR CREATIVE EXPRESSION

A healthy favourable atmosphere for creative thinking, and expression is an essential condition for the stimulation and nourishment of creativity among children. There is a need to balance the rate of learning with its application, the passive receptivity with challenging productivity, and the stable certainty with risk and adventure. There is a need for sympathetic atmosphere in schools as well as at homes. For providing opportunities for creative expression, we can make use of the co-curricular activities in schools. Our social festivals, religious and social get - togethers, exhibitions etc. can also provide the opportunity for creative expression. A regular classwork can be arranged in such a way as to stimulate and develop creative thinking among children.

DEVELOPING HEALTHY HABITS AMONG CHILDREN

Industriousness, persistence, reliance and self-confidence are some of the qualities that are helpful in creative output. Therefore, children should be helped to imbibe these qualities. Moreover, they should be made to stand against the criticism of their creative expression. They should be made to feel that whatever they create is unique and it expresses what they desired to express.

USING THE CREATIVE RESOURCES OF THE COMMUNITY

Children should be made to visit the centers of creativity for scientific and industrial creative works. It can stimulate and inspire them for doing some creative work.Occasionally, creative artists, scientist and creative persons from other fields may also be invited to schools. It can be helpful in enhancing the span of the knowledge of our children and kindle the spark of creativity among them.

AVOIDANCE OF BLOCKS TO CREATIVE THINKING

The factors like conservatism, faulty methods of teaching, unsympathetic treatment, fixed and rigid habits of work, anxiety and frustration, high standards of achievement for low levels of work, overemphasis on school marks, authoritarian attitudes of teachers and parents etc. are known to be detrimental towards fostering creativity

among children, Therefore, as far as possible parents and teachers should try to avoid such factors in upbringing and educating the children.

PROPER ORGANIZATION OF THE CURRICULUM

Learning experiences in the form of curriculum should be so designed that it fosters creativity among children. For this purpose we should organize the school curriculum primarily on the basis of concepts rather than facts. It should also cater to the individual needs of the students rather than to the generalized needs of every student. It should also follow the general philosophy that truth is something to be sought for rather than something to be revealed. It should be quite flexible and have provision for studying and doing something without the threat of evaluation. In a nut shell, the curriculum should reflect what is desired from the creative children in terms of fluency, flexibility, originality, divergent thinking, inventiveness and elaboration etc.

REFORM IN THE EVALUATION SYSTEM

Our education system is totally examination - ridden.Therefore, for making efforts to nurture creativity we must have suitable reforms in our evaluation system. The emphasis on rote memory, fixed and rigid single responses and convergent thinking etc. which kill the creativity of the children, should be abandoned and a proper system of evaluation for encouraging complete and balanced experiences in developing their creative behaviour should be adopted.

USE OF SPECIAL TECHNIQUES FOR FOSTERING CREATIVITY

Researchers in the field of creativity have suggested some special techniques and methods for fostering creativity among children. A few of these are mentioned below :

BRAINSTORMING

Brainstorming is a strategy or techniques for allowing a group to explore ideas without judgement or censure. In actual practice children may be asked to sit in a group for solving a problem and attacking it without any inhibition from many angles, in fact literally storming it by a number of possible ideas and solutions. To start with, the students may be provided with a focus, i.e. a particular problem like 'Students Unrest', Growing unemployment in India', How to check truancy in our

school', What to do for improving school library services' and so on. The students are then asked to suggest ideas as rapidly as possible by observing the following norms :

(i) All ideas to be encouraged and appreciated, therefore, no criticism be allowed during the brainstorming session.

(ii) Students are encouraged to make their ideas as possible and suggest as many ideas as they can.

(iii) They are encouraged not only to put together separate ideas but also to suggest ideas that may be built on ideas already given by the fellow students.

(iv) No evaluation or comment of any sort should be made until the session is over.After the expiry of the session, all the ideas received (preferably written on the blackboard) should be discussed in a very free, frank and desirable environment and the meaningful ideas should be accepted for the solution of the problem in hand.

USE OF TEACHING MODELS

Some of the teaching models developed by educationists may prove quite beneficial in developing creativity among children. For example, Bruner's Concept Attainment Model helps in developing creativity in children for the attainment of various concepts. Similarly ,Suchman's Inquiry Training Model is very helpful in developing creativity among children besides imparting training in the acquisition of scientific inquiry skills.

USE OF PLAY WAY, PROBLEM SOLVING AND QUIZ

Gaming techniques, in a play way spirit, help the children in the development of creative aspects. These techniques provide valuable learning experience in a very relaxed, untimed and evaluative situation. The stimulus material used in such techniques is both verbal as well as non verbal. For illustration in verbal transaction of ideas, the following types of questions may be addressed to the children.

(i) Name all the round things you can think of.

(ii) Tell all the different ways you could use a knife.

(iii) Tell all the ways in which a cat and dog are alike.

In non-verbal transactions, children may be asked to build a cube, construct or complete a picture, draw and build patterns, interpret the patterns of drawing and sketches, and build or construct anything out of the raw material given to them.

PROVIDING THE SELF - EXAMPLES AND IDEALS

There is a truth in the saying that 'Self Example is better than precept.' Children are very imitative. The teachers and parents, who themselves travel on the beaten track and do not show any originality by taking the risk of being wrong or never experience an excitement of creating a novel act, fail to cultivate creativity among their children. Therefore, the teachers and parents must try to develop the habit of creative thinking among themselves. They should believe in change, novelty and originality and experience the creative process themselves. Their teaching, their mode of behaviour must reflect their love for creativity. Then and only then can they inspire children for being creative.

3.6 Let us sum up

At the end of this unit, let us recapitulate and put our learning together in a nutshell. Intelligence-concept & various theories came up with a whole new comprehension of intelligence. These theories present the different attributes of intelligence. Measuring intelligence, i.e., the various intelligence test devised and formulated by the eminent psychologist also give us a clear idea of using them effectively and judiciously. This unit also dealt with memory, its concept, types and theories. Relation between memory and forgetting give us an understanding to analyze the causes of forgetting and synthesize the factors of retention and enhance the process of memorization. The last concept that has been dealt here is the creativity. A clear concept of creativity, factors affecting creativity and fostering creativity among children have been presented in a very lucid way,

3.7 Unit end exercise

1. Give a widely accepted definition of intelligence.
2. Mention some of the characteristics of intelligence.
3. Describe in brief the two-factor theory of intelligence.
4. What is meant by 'intelligence test'?
5. List three features of verbal and non-verbal tests of intelligence.
6. Define memory.
8. What are the causes of forgetting?
9. Mention some of the ways of fostering creativity in the classroom.
10. Distinguish between two types of memory that you have learned.

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Unit - 4 ◻ Personality

Structure

4.1 INTRODUCTION

In this unit you will study about concept, definition and different theories of Personality. Personality is the product of social interaction in group life. In society every person has different traits such as skin, colour, height and weight. They have different types of personalities because individuals are not alike. It refers to the habits, attitudes 'as well as physical traits of a person which are not same but have vary from group to 'group and society to society, everyone has personality, which may be good or bad, impressive or unimpressive. It develops during the process of socialization in a culture of a specificgroup or society. An individual's personality cannot be determined exactly because it varies from culture to culture and time to time. For example, a killer is considered criminal in peace time and hero in war. It is the sum of total behaviours of the individual area covers both overt and covert behaviours, interests, mentality and intelligence. It is the sum of physical and mental abilities and capabilities.

4.2 OBJECTIVES

After learning this unit, you will be able to:

- Understand and discuss the concept of personality;
- Understand different definitions of personality;

- Understand and discuss in your own words different dimensions of personality;
- Discuss different Theories of Personality;
- Explain the different measurement techniques for assessing Personality; and
- Discuss the Concept and Causes of Individual Differences in Classroom.

4.3 DEFINITION, HEREDITY AND ENVIRONMENT AS DETERMINANTS OF PERSONALITY.

The term personality has been defined in various ways by the psychologists who worked on the problem of personality and the variables influencing its development.

MEANING OF PERSONALITY

Personality has been derived from the Latin word **"persona"** which means "mask"used by the actors to change their appearance. It is the combination of an individual's thoughts, characteristics, behaviours, attitude, ideas and habits.

DEFINITIONS OF PERSONALITY

Personality is all that a person is. It includes everything about the person, his physical,emotional,social, mental and spiritual make - up.

So, definitely, the term personality signifies something deeper than mere appearance or outward behaviour. How should it be given a proper meaning or definition is a difficult problem.

With the Latin meaning of the term personality taking backseat and acceptance of personality as an all-inclusive concept, scientists from different disciplines of knowledge approached personality from different angles. Their efforts can be summarized under the following headings:-

Popular Definitions of Personality

This comprises those definitions of personality which place emphasis _on social values. For instance, a person who is attractive and good looking, is liberal, easily mixes up in social situations and exhibits socially desirable characteristics, is measured in popular parlance as having the best personality. Though, this definition does not fit every individual. Going through this definition would result in some people having no personality at all. Besides, you know very well that in real life we often encounter people who have all the charms, they exhibit all the socially desirable traits but their tendencies are antisocial, for instance, noted criminal Sobhraj. He has an exterior

pleasing personality but basically has a criminal behavioural tendency. He killed several innocent people.

Political Definition of Personality

According to political definition, a person has personality only when he is charismatic, attractive and represents the masses. He should be able to present himself in an impressive manner at a public debate. His personal life should be marred with scandals. Even this definition is not acceptable for if we accept this definition then majority of political leaders should not have any personality.

Biophysical Definition of Personality

This category of definitions regards personality as organic internal element of a person. It regards personality as consisting of traits which lend themselves to objective measurement. For instance, Sheldon classified people on the basis of physique. He described three types of personality namely: endomorphic, mesomorphic and ectomorphic, with endomorphic being fat and fleshy, mesomorphic being athletic in build with a lot of muscles and ectomorphic being thin and bony in build.

Omnibus Definition

This category comprises all those concepts which lay emphasis on the description of personality. Morton Prince (1924)'s definition best represents this approach. According to him — Personality is the sum total of all biological, innate dispositions, impulses, tendencies, appetites and instincts of the individual and the acquired dispositions and tendencies acquired through experiences. Although all encompassing, it is criticizing on the basis of this being highly subjective and intricate.

Psychological Definition

This definition comprises all those which describe personality on the basis of variables like adjustment, temperament, uniqueness, and dynamic organization. Under this category we can place quite a number of definitions but for our purposes we will consider only a few. Personality is the dynamic organization with in the individual of those psychophysical systems that determine his unique adjustment to his environment. (Allport, 1938).

Personality usually refers to the distinctive patterns of behaviour (including thoughts and emotions) that characterize each individual's adaptations to the situations of his life or her life. Personality is usually defined as individual's unique and relatively

stable patterns of behaviour, thoughts and emotions. (Baron, 1993).,

SOME GLARING FACTS ABOUT PERSONALITY

Based on our discussion so far, we can conclude the following things about personality:

1. Firstly, personality is something unique and specific. Each one of us is a unique pattern in ourselves. No two individuals, not even identical twins, behave in precisely the same way over a period of time.Every one of us has specific characteristics for making adjustment.

2. The second main characteristic of personality is self-consciousness. The man is described as a person or as having a personality when the idea of 'self enters into his consciousness. In this connections H.R. Bhatia (1968) writes. *"We do not attribute personality to a dog and even a child cannot be described as a personality because it has only a vague sense of personal identity.*

3. Personality includes everything about a person. It is all that a person has about him. it includes all the behaviour patterns, i.e. conative, cognitive and affective, and covers not only the conscious activities but goes deeper to semi -conscious and unconscious levels also.

4. It is not just a collection of many trails or characteristics that is known as personality. For instance, by only counting the bricks how can we described the wall of a house? It needs something more and actually personality is more than this: It is an organization of some psycho-physical systems or some behaviour characteristics and functions as a unified whole. Like when describing an elephant, we cannot say that it is like a pillar only by examining its legs.Similarly, by looking at one's physique or sociability, we cannot pass judgement about one's personality. It is only when we carefully study all the aspects - biological as well as social - we can form an idea about his personality.

5. Personality is not static, it is dynamic and ever in the process of change and modification. As we have said earlier, personality is all that a person has about him. It gives him all that is needed for his unique adjustment in his environment. The process of making adjustment to environment is continuous. One has to struggle with the environmental as well as the inner forces throughout one's life. As a result, one has to bring modifications and changes in one's personality patterns and it makes the nature of personality dynamic instead of static.

6. Every personality is the product of heredity and environment. Both contribute significantly towards the development of the child's personality.

7. Learning and acquisition of experiences contribute towards growth and

development of one's personality. Every personality is the end product of this process of learning and acquisition.

8. Everyone's personality has one more distinguishing feature, that is aiming to an end or some specific goal.Adler, in his book 'Individual Psychology'opined that a man's personality can be judge through a study and interpretation of the goals he has set for himself to achieve and the approaches he makes to the problems in his life. In this way, he gives a very concise meaning to the personality of an individual by calling it *'lifestyle of an individual"*. Indeed, this short and concise explanation of the terms has a wide meaning. It draws a beautiful portrait of an individual's totality. It may be understood as the sum total of one's way of behaving towards oneself as well as others. It also predicts one's nature of behaviour as to how will one behave in a particular situation and one's pattern of adjustment to the ever-changing forces of environment.

Determinants Of Personality

There has been a constant warfare between hereditarians and environmentalists as regards the contribution of these factors in the development of personality. There are some psychologists who overemphasize the environmental influences to the exclusion of heredity in the growth and development of personality and there is another group of psychologists who claim the superiority of heredity over environment in the development of personality. As a matter of fact, no definite line of demarcation can be drawn between the contribution of heredity and environment in the development of personality. This is an old problem which has not yet been conclusively solved.

There is no doubt that an individual is the by- product of heredity and environment of the constant interaction of heredity and environmental factors. These two factors contribute to the development of an individual. The way an individual is like or different from other individuals in his performance and personality is due to these factors. The teacher must havethe knowledge of individual difference and their causes in order to teach efficiently and to deal effectively with students in the class. To understand behaviour, the teacher must have the basic knowledge of genetics because the organism is born with certain biological inheritance. The influences of genetics on the individual, in many respects, can be considered preliminary to understand human behaviour. He must also have the knowledge of environmental factors which influence the development of the individual and group of students. It is very difficult to deal in detail all studies which throw light on the contribution of heredity and environment, so we will mention only a few of them here.

DETERMINANTS OF PERSONALITY

Man is the by-product of a complex system of variables which constantly interact with personality and shape it. There are some important determinants which influence personality more than other factors. Genetic factors are basic that determine the personality development of an individual. Physiological determinants such as ductless glands, nervous system, emotion and motivation, all play an important role in the development of an individual's personality. Then there are a number of psychological factors which directly and indirectly influence growth and development. Social and cultural factors also help in moulding personality. We will discuss only genetic, social and cultural determinants of personality in the following paragraphs:

(1) GENETIC DETERMINANTS

Let us first explain the meaning of the term heredity. Heredity is of two types: *biological heredity,* which the child inherits from his forefathers in the form of chromosomes and second is *social heredity,* which means all that one generation gets from preceding generations in the form of social traditions, customs and skills etc. Each generation transmits the acquired skills and knowledge to the succeeding generations.

Principles of Heredity

Like begets like. Even a layman knows that a cat gives birth to kittens, lions have cubs and human beings have babies. Children, generally, resemble their parents or relatives. But we also find that in many cases children do not resemble their parents. There are numerous instances where intelligent parents have dull children or handsome parents have ugly children. This variation is universal in nature and is called the *Principle of Variability of Inheritance.* There are two principles: one is of *Resemblance* and the other of *Variability. Genetic Material*

We know that a tiny seed carries within itself all the elements from which there will emerge a full grown tree. In the same way, germ cells carry all the characteristics of a potential child. This is called biological heredity of the child.

Mechanism of Heredity

When the human sperm and egg unit, the fertilized egg is called zygote. Each parent provides twenty-three pairs of chromosomes, for the process of fertilization. Chromosomes are also called coloured body. Every cell in the body contains the same number of chromosomes. The number of chromosomes in a cell is constant for

a given specious but varies widely from one species to another. All human cells have forty - six chromosomes; half of the chromosomes come from the mother and half from the father. Within the chromosomes,there are thousands of genes. These genes are the carries of heredity characteristics from one generation to another. Genes are minute particles located in the chromosomes.

The Genetic Code

In the year 1962, the Nobel prize winners discovered the structure of the material of heredity which throws new light on the traditional views of the composition of chromosomes. Chromosomes are made up of long organic molecules whose substance, deoxyribonucleic acid (DNA) is found in the chromosomes as two long strands periodically connected by chemical bonds.

The most constant feature of genetic material is the order of four basic compound connecting the two strands of DNA. Our heredity information is not in the long strands of DNA but in their order of appearance between the two strands of DNA. The sex of the individual is determined by genes. One pair of chromosomes is concerned with the sex of the child. Women have two special sex chromosomes called X chromosomes. Men have an X and a longer Y. Thus we see that a male has both X and Y chromosomes while the female has only X chromosomes. If one of the X sperm units with an egg, also carrying an X chromosomes, then the child will be a girl. If a Y sperm meets an egg, the offspring will be a male child.

Dominant and Recessive Traits

Genes, the carriers of human traits, are two types; *dominant* and *recessive.* Genes occurring in paired positions along the chromosomes carry contributions towards the same characteristics but can give information of development. One gene may cause development of blue eyes while matched gene in the other chromosome may act to produce brown eyes. When both genes of the chromosomes act to foster identical characteristics in the offspring, this is said to represent the *homozygous condition.* If the information concerning a given characteristic differed in the paired gene position, the condition is called *heterozygous.* In many cases, one of the tendencies of the pairs of genes found in the heterozygous condition will dominate. Thus, when a child inherits a gene for blue eyes from one parent and a gene for brown eyes from the other, the child will have brown eyes. Therefore, we call the gene for brown eyes dominant.

SOME IMPORTANT STUDIES

1. Kellogg and Kellogg, in order to study the influence of heredity and environment, conducted a systematic research on their own son and a chimpanzee. The age of their son Donald was 10 months and that of chimpanzee Gua was 7 1/2 months. Both were reared in the same environment with same facilities. After a systematic study of their behaviour it was found that in the beginning Gua surpassed Donald in motor skills of jumping, running and climbing etc, Gua also learned some social behaviour, as walking, eating with spoon and drinking from a glass etc. He could learn 95 words only. Donald caught him in all areas of development except in physical strength. This unusual study shows that heredity sets a limit for maximum development which cannot be surpassed even by providing the best environment.

2. Wolf- children of Midnapur. A Missionary in Bihar found two children who were taken by wolves in early childhood. These children were reared in the company of wolves. They learned to walk on four limbs, ate raw fresh and verbalized like wolves. They were brought back from the forest and kept in hospital. One of the child died and the other could hardly learn elementary things. This study of wolf - children throws light on the importance of environment in the development of personality. There are many studies in which normal children were devoid of social interaction resulting in maladjustment in the society.

Conclusion of the Studies

1. All the studies we have surveyed proved that heredity and environment both play an important role in the development of personality. An individual is the by-product of the constant interaction of heredity and environment influences,

2. Heredity does not completely determine any characteristic or trait but it provides the basis or potential for the development of any personality trait. Training and experiences in the environment contribute to the development of traits.

3. Heredity influences physique, motor - sensory equipment and level of intelligence, Recently it has also been established that certain diseases and temperamental characteristics are also inherited from forefathers.

4. Bad environment can suppress good inheritance but good environment is not a substitute for bad heredity. Heredity sets the limit of the maximum development of a characteristic which cannot be crossed by providing best environment. The best environment cannot turn an idiot into a talented person. Good training and experienced definitely improve the performance of children.

5. All psychologists have reported that intelligence is influenced by the type of education, occupation of parents and rural urban living etc. Cultural and environment have a positive effect of the development of personality characteristics.

6. Substantial difference in intelligence can be created by providing an appropriate environment in early childhood.

(2) SOCIAL DETERMINANTS

Environmental influences begin since the time of the conception of the child in the mother's womb. Mother's mental, physical and emotional conditions influence the development of foetus in the womb. The external environment starts from the time of the birth of the child.

Man is a social animal. He is born in a social set-up. All men are born alike with respect to their biological need. Differences are created by social environment in which needs are fulfilled. Physical and geographical conditions of the environment play an important role in shaping the personality of human beings. People living in deserts, hilly areas and plains have great differences in their body built, height, mode of living, colour and habits etc. Physical and geographical environments create distinctive personality characteristics in human beings. Social environment of home greatly influences the development of personality.

(1) Role of Home

All psychologists agree that personality of an individual develops with constant interaction between biological inheritance and environment forces. The home plays most important role in shaping the personality pattern of an individual in early infancy. The first environment the child moves in, is his home. Here the child comes in contact with his parents and other members of the family. His likes, dislikes, stereotypes about people, expectancies of security and conditioned emotional responses, are all shaped in early childhood. There are several empirical evidences which support that childhood experiences are decisive determinants of personality in later life. The type of training and early childhood experiences play an important role in the development of personality.

Infantile deprivation in human is unethical. Few experiments on human infants by depriving them of light, sound, food or comfort have been conducted. One such attempt was made by Margaret Kibble in 1944 who initiated a series of investigations on the effect of severe psychological deprivation in infancy. She reports on the basis

of the result of a study of 600 children that lack of adequate cuddling and other close physical contact with some friendly adult can impose serious handicaps on the growing infant. Another important study was conducted by Brody, in 1956 who studied the patterns of mothering. She studied 32 young mothers with their babies paying particular attention to methods of feeding, cleaning, offering objects and speaking to the baby. She concluded that patterns of mothering are important to develop future personality of children.

Role of School

School plays an important role in moulding the personality of children because significant part of a child's life is spent in school between the ages of 6 and 20 years. Here he continuous the process of liking and disliking conforming and rebelling, acquiring a conception of the world and himself. Obviously, much of the child's personality is already shaped in home before he comes to school. Here the teacher substitutes the parents. His bahaviour plays significant role for the child's development. The school poses new problems to be solved, new taboos to be accepted into the superego and new models for imitation and identification, all of which contribute their share in moulding personality.

The importance of the principle or administration in maintaining discipline and determining emotional tone of school has been illustrated by Lyman in 1949. He was impressed by the contrast between two schools in the same neighbourhood - one school extended perfect cooperation and in the other there was complete disorder.

He tried out an inventory of attitudes toward the school and found that in the disorderly school attitudes of children were exceedingly, unfavourable. They were hostile towards the principal. We see that some administratorswill be relatively more authoritarian, others more democratic and will develop personality traits likewise.

(3) **Role of the Teacher**

The teacher is an important constituent in the instructional process who can play a crucial role in shaping the personality of students. The way he teaches and handles the students has an effect on the future personality of children.

Ryan and Wundt (1955) conducted a study in the independent dimensions of

teachers' behaviour which are as follows :

a) Fair and democratic.

b) Business - like, organized, responsible.

c) Encourages students' participation, challenging and interesting.

d) Enthusiastic.

e) Open - minded.

Teacher's role and social climate in the class. The way the teacher carries out his role in the class affects the emotional climate in the classroom. An authoritarian teacher will establish an autocratic climate and democratic teacher will create a different kind of climate. These differences in the attitudes of teachers will imply differences in the number of frustrations imposed upon the student and in the kind of personality development encouraged.

From different related studies, it may conclude that democratic approach is better than autocratic approach in developing good personality traits, It permits maximum personality development for each child, prepares him for group living, and for making his own decisions, and gives superior training in emotional self-control.

Failure and the experience of failure in school is bound to have painful effect on children and leave a permanent impression on the personalities of children. Studies show that children who repeatedly fail in examinations are rated as cruel, unfriendly, unhappy, quarrelsome, impolite, boastful and selfish.

The examination and type of present curriculum does not cater to the needs of many children and consequently they are frustrated, resulting in the development of undesirable personality traits.

Attitude towards teaching. The attitude of the teacher toward teaching is an important variable. Teachers have different opinions as some believe that children should be seen, not heard but other want to encourage children to feel that the teacher is a friend. The primary attribute of a good teacher is the ability to create a warm, friendly atmosphere in the classroom. Teaching should be geared to the needs of the child. The teacher must have a positive attitude toward teaching. He must have sympathetic attitudes toward deviant children. The teacher must try to locate the causes of antisocial behaviour and help the children to improve their personality.

Lastly, we may conclude that the school plays an important role in shaping the personalities of children by creating better emotional atmosphere, better teaching methods, use of catharsis and by providing guidance and counselling.

(3) CULTURAL DETERMINANTS

Every society is characterized by its cultural heritage which is transmitted from generation to generation in the form of social heredity. Indian society is very rich as regards its cultural inheritance that has a deep influence on children. Personality of an individual is gradually shaped by the culture he is born in E.B. Tyler, the famous anthropologist, defined culture as, "It is that complex whole which includes knowledge, beliefs, morals, law, custom and many other capabilities and habits acquired by man as a member of society." Culture refers to total life activities of a society. What people think or do and feel constitute the culture of a society. In the course of development, society stabilized certain patterns of behaviour which are followed by the members of a society. It develops certain common personality characteristics in the members. Hence we may conclude that culture influences the personality development of an individual.

4.4 TYPE AND TRAIT THEORY, PSYCHOANALYTICAL THEORY

TYPE APPROACH

The psychologists adopting Type approach advocate that human personalities can be classified into a few clearly defined types and each person can be put in one or the other type depending upon his behavioural characteristics, somatic structure, blood types, fluids in the body, or personality traits. Based on such approach, the physicians of ancient India broadly categorized all human beings into three types. This classification was based on the three basic elements of the body, i.e. *pitt* (bile), *bate* (wind) and *huff* (mucus). Almost the same approach was followed by the Greek physicians like Hippocrates, one of the disciples of the great philosopher Aristotle. In the subsequent years, many more scholars and psychologists tried to divide persons into certain types depending upon their specific criterion. Let us described a few of such approaches.

HIPPOCRATES' CLASSIFICATION

According to Hippocrates, the Human body consists of four types of humours of

fluids - blood, yellow bile, phlegm (mucus) and black bile. The predominance of one of these four types of fluids in one's body gives him unique temperamental characteristics leading to a particular type of personality summarized as in the following table.

Hippocrates' Classification

Dominance of fluid type in the body	Personality types	Temperamental Characteristics
Blood	Sanguine	Light hearted, optimistic, happy, hopeful and accommodating.
Yellow bile	Choleric	Irritable, angry but passionate and strong with active imagination.
Phlegm	Phlegmatic	Cold, calm, slow or sluggish, indifferent.
Black bile	Melancholic	Bad tempered, dejected, sad, depressed, pessimistic, deplorable and self- involved

KRETSCHMER'S CLASSIFICATION

Kretschmer classified all human beings into certain biological types according to their physical structure and has allotted definite personality characteristics associated with each physical make- up as given in Table below.

Personality types	Personality characteristics
i) Pyknic (having fat bodies)	Sociable, jolly, easy going and good natured.
ii) Athletic (balanced body)	Energetic, optimistic and adjustable.
iii) Leptosomatic (lean and thin)	Unsociable, reserved, shy, sensitiveand pessimistic

SHELDON'S CLASSIFICATION

Like Kretschmer, he also classified human beings into certain types according to their physical structure and attached certain temperamental characteristics to them as given in table below:

Sheldon's Personality Types

Personality types	Somatic or body structure description	Personality characteristics
i) Endomorphic	Person having highly developed viscera but weak somatic structure. (Like Kretschmer's Pyknic type).	Easy going, sociable and affectionate.
ii) Mesomorphic	Balanced development of viscera and somatic structure. (Like Kretschmer's Athletic type).	Craving for muscular activity, self -assertive, loves risk and adventure.
iii) Ectomorphic	Weak somatic structure as well as undeveloped viscera. (Like Kretschmer's Leptosomatic).	Pessimistic, unsociable and reserved.

The approach adopted by the above psychologists to classify on the basis of correlation between structure of the body and personality characteristics, is skewed. It is somewhat misleading. There does not exist such perfect body -mind or body - heart correlation as the propagators of these approaches have assumed.

JUNG'S CLASSIFICATION

He divided all human beings basically into two distinct types - Introvert and Extrovert - according to their social participation and the interest they take in social activities. Later on, he further sharpened his two - fold division by giving sub - types. In this process, he took into consideration the four psychological functions - thinking, feeling, sensation and intuition - in relation to his previous extrovert and introvert types.

FRIEDMAN AND ROSENMAN'S CLASSIFICATION

This classification of personality type is given by Meyer Friedman and Ray Rosenman. It classifies the people into two personality types, type A andtype B, on the basis of their personality traits and then points out which type of people are more prone to heart ailments particularly coronary heart disease. In coronary heart disease, there is malfunctioning of the heart on account of the deficiency in supply and circulation of the blood through arteries and veins. For a long time it was thought that cholesterol

deposits in the arteries and veins obstructs the free flow of blood which in turn proves a potent factor for the deficiency in supply and circulation of blood to the heart. Friedman and Rosenman with the active assistance of some medical experts tried to establish through their researches that stress is an important causative factor for the coronary heart disease. They further established that a particular type of people possessing a set of particular personality traits named as type A are more prone to the stress producing behaviour in sharp contrast to the people belonging to type B. They further outline the typical personality traits associated with these personality types 'A' and 'B' in the following way. A Type Personality

Emotionally unstable, tense, worried, irritating, competitive, high achieving motive, moody, indifferent, active and restless, aggressive, crazy, perfectionist, idealist, rigid, much worried about punctuality and rules, hasty, jealous, dissatisfied with the self and others, suspicious, sensitive, insecure, believer in action and not in fate and fortune, etc. B Type Personality

Emotionally stable, tension - free, happy and jolly, average achieving motive, insensitive, patient, self- satisfied, calm and quite flexible, tolerant, realist, optimist, having faith and trust in one's self and others, adjusted to one's self and other, believer in the philosophy of fate and fortune, sincere but not too serious about the execution and result of the work etc.

TRAIT APPROACH

The approach that makes use of the personality traits for identifying and describing the personality of an individual is known as Trait Approach. The main propagators of this approach are the famous psychologists Gordon Allport and R.B. Cattell. Let us know about their attempts in this direction.

ALLPORT'S TRAIT APPROACH

G.B. Allport (1897 - 1967) was the first personality theorist who adopted trait approach in providing a theory of personality. According to Allport, personality trait are the basic units of the structure of our personality, Allport tried to search these basic units of human behaviour. The problem before him was to decide the number of personality traits representing the human behaviour in its totality. He, along with one of his colleagues listed 17,953 words in the English language with the help of available dictionaries for the description of the personality or behaviour of human beings. After analysis and rejection of the words on the basis of synonym and inappropriateness,

he arrived at 4,541 words for classifying these into three main types named as cardinal traits, central traits and secondary traits.

Cardinal Traits are the most active and dominant traits of one's personality. Although present in a very small number as one or two, these are enough to colour the personality according to their characteristics. As an example we can cite sense of humour as a cardinal trait in one's personality. This trait may colour a person's personality in a specific way so much so that he may be identified or known through his behaviour almost dominated by the sense of humour at all the times and occasions.

Central Traits are those traits that are frequently employed for identifying and describing one's personality, e.g. honesty, kindness, timidity, shyness, rigidity, cruelty etc. Usually seven or eight such central traits are enough for knowing and describing the personality of an individual.

Secondary Traits are those traits of an individual's personality that play quite a secondary or insignificant role in the identification and description of one's personality. These are in fact not the essential part of one's personality. That is why these are reflected quite rarely in one's behaviour like a person named as miser, selfish, greedy.

So according to Allport, one's cardinal traits along with a few selected central traits may play a dominant and significant role in the proper identification of one's personality from others. Thus, they may provide speciality and separate identification to different individuals of the persons. The rest of the central traits along with a few secondary traits can then make agroup of common traits which are generally found in most of the people. Hence in the task of identification, naming and describing the individuals on the basis of their personality characteristics or traits, we should mainly take into account the cardinal and central traits present in their behaviour.

CATTELL'S TRAIT APPROACH

R.B. Cattel, a British - Born American researcher, tried to further advance the trait approach advocated by Allport. For this he made use of the same 17,953 dictionary words pointed out by Allport (capable of describing human behaviour and personality) for arriving at some fundamental dimensions or factors for the measurement of one's personality through the following simple non-technical description.

1. He began his task in 1956 with approximately 4,000 of Airport's 17,953 terms and narrowed the list down to 171 by eliminating the repeated ones and synonyms. In this way, he arrived at the final list of 171 words (dictionary words) related with personality and called them *trait elements.*

2. The next step was to find out how they are related. He found that each trait

element correlated high with some and low with others. In this way, he managed to form some specific groups and called them ***Surface Traits.*** These identified surface traits were 35 in number.

3. He once again went on to examine these surface traits in terms of their inter correlations. There was overlapping. The removal of such overlapping gave him the desired basic dimensions which he called ***Source Traits,*** i.e. the real structure influence underlying personality.

4.He ultimately concluded that ***16 Factors*** or Basic Dimensions of personality given below are sufficient to described one's personality. Each of these factors may be seen to carry a set of opposite personality traits, i.e. Relaxed V/s Tense or Practical V/s Imaginative etc. as shown in the Table below:

The Set of Personality Traits Existing in Cattel's Sixteen Personality Factors

Name of the Factor	*Trait*	*Opposite trait*
A	Reserved	Outgoing
B	Less Intelligent	More intelligent
C	Affected by feelings	Emotionally Stable
E	Submissive	Dominant
F	Serious	Happy - go - Lucky
G	Expedient	Conscientious
H	Timid	Venturesome
I	Tough - minded	Sensitive
L	Trusting	Suspicious
M	Practical	Imaginative
N	Forthright	Shrewd
O	Self-assured	Apprehensive
Q1	Conservative	Experimenting
Q2	Group - dependent	Self- sufficient
Q3	Uncontrolled	Controlled
Q4	Relaxed	Tense

5. Cattell made use of his 16 factors or basic dimensions of the personality in the construction of a personality inventory known as **Cattell's Sixteen Personality Factors** or **Sixteen P.F. Inventory.** This inventory is widely used for the measurement of the personality. In this way, efforts made by R.B. Cattell to know and measure one's personality using trait approach may be said to be appreciable.

FURTHER DEVELOPMENT IN TRAIT APPROACH

Further researches in the field of trait conception of the personality have highlighted the repetition and similarity of the terms used by Cattell for describing human behaviour in terms of 16 dimensions. For example, there stands much similarity and high correlation between the traits represented by factors 1 and 16 and also by factors 3 and 7. An individual who is calm is automatically relaxed and one who is tense can be described as emotional or easily upset. Similarly someone who is shy and timid can be described as reserved or unfriendly and an outgoing friendly personality will be also found venturesome. Therefore, the latest researchers have been able to reduce the number of traits as well as the number of dimensions (factors) for describing personality. (Piedment, Mccral and Costa, 1991) as given in Table below:

Five Dimensions of Personality and the Related Traits

Dimension or Factor	*Traits*
1. Extroversion	Traits like talkative, sociable and adventurous.
2. Agreeableness	Traits like good natured, cooperative and likeable.
3. Conscientiousness	Traits like demonstrating responsibility, neatness and task motivation.
4, Emotional stability	Traits like calmness, poise and composure.
5. Culture	Traits like intelligence, interest, philosophy and art.

PSYCHO - ANALYTIC APPROACH OF FREUD

This approach for understanding and knowing about personality belongs to the school of psycho-analysis. The famous psychologist Freud is said to be the profounder of this school of thought. Let its try to have a look at the ideas and thoughts propagated by Freud through his psycho-analytic approach.

1. Basic instincts are the basic guiding factors of human behavior. Two of these

instincts play quite an effective role in this direction. These are known as Life and Death instincts. While **Life Instinct** (also known as 'Eros') provides a burning desire and positive urge to remain alive and lead the life in a satisfactory way, the **Death Instinct** (also known as 'Thanatos') builds up a negative attitude towards life and guides one's behaviour towards destruction, revolt, aggression or detachment and suicidal tendencies.

2. Human behaviour is by all means centred around the sex needs. The adjustment or maladjustment in one's life mostly depends upon the degree of the gratification of one's sex needs.
3. Mind or psyche plays quite a significant role in directing one's behaviour. According to Freud, human mind or psyche can be divided into three compartments in the form of *conscious, semi - conscious* and *unconscious.* These three divisions of human mind are responsible for the three types of human behaviour, namely conscious, semi - conscious and unconscious. The unconscious behaviour being 9/10 part of the total behaviour, always dominates the total behavioural aspects and personality make - up of an individual.
4. Freud put up the idea that the anatomy of our personality is built around the three unified and interrelating systems - Id, Ego and Super Ego.

The Id is the raw, savage and immoral basic stuff of a man's personality that is hidden in the deep layers of one's unconscious mind. It consists of such ambitions, desires, tendencies and appetites of an individual as guided by pleasure seeking principle. It has no values, knows no laws, follows no rules, does not consider right from wrong and considers only the satisfaction of its needs and appetites.

Obviously, the Id cannot be allowed to discharge its energy wildly and irresponsibly and thereby a second system, the ego functions as a policeman to check the unlawful activities of the Id. It is the executive with Veto powers. It follows the principle of reality and acts with intelligence in controlling, selecting and deciding what appetites have to be satisfied and in which way these are to be satisfied.

The third system of personality is super ego. It is the ethical moral arm of the personality. It is idealistic and does not care for realities. Perfection is its goal rather than pleasure. It is a decision - making body which decides what is bad or good, virtue or vice according to the standard of society that it accepts. The above mentioned constituents of personality play a significant role in deciding the personality of an individual. Let us see how.

1. The individuals who have a strong or powerful ego are said to have a strong or balanced personality because in their cases, ego is capable of maintaining proper

balance between super ego and Id.

2. In case an individual possesses a weak ego, he is bound to have a maladjusted personality. Here two situations may arise. In one situation the super ego may be more powerful than ego. In such a case, it would not provide a desirable outlet for the repressed wishes and impulses.Consequently, it may lead to the formation of a neurotic personality. In another situation, Id may prove more powerful than ego. The person, thus may engage himself in unlawful or immoral activities leading towards the formation of a delinquent personality,

Freud tried to explain the gradual development of the human personality through his well - known concept of psycho - sexual development explained in detail as under.

According to Freud, sex is the life urge of fundamental motive in life. All physical pleasures arising from any of the organs or any of the functions are ultimately sexual in nature. Sexuality is not the characteristic of only the grown-ups. Children from the very beginning also have sexual desires. This, he termed as infantile sexuality. A child passes through the following four stages with respect to his psycho-sexual development.

The **Oral Stage:** According to Freud, mouth represents the first sex organ for providing pleasure to the child. The beginning is made with the pleasure received from the mother's nipple or the bottle. Thereafter, it is used to derive pleasure by putting anything like candy, stick, his own thumb, etc. in his mouth. The Anal Stage: At this stage, the interest of the child shifts from mouth (as the erotogenic zone) to the organs of elimination, i.e. anus or the urethra. He receives pleasure by holding back or letting go of the body's waste material through the anus or urethra. This stage,generally, ranges from two to three years.

The Genital Stage: Duration of this phase, in the development of the child, ranges from 4 to 6 years. At this stage the child's interest gets shifted from the eliminating organs to the genitals. The children now come to note the biological differences between the sexes and derive pleasure from playing and manipulating the genital organs. This type of awareness about sex organs according to Freud, may give birth to a number of complexes.

The Latency Stage: This period starts from six years in the case of girls and seven to eight years in the case of boys and extends till the onset of puberty. At this stage, boys and girls prefer to be in the company of their own sex and even neglect or hate members of the opposite sex.

The Phallic Stage: Puberty is the starting point of the phallic stage. This adolescent

boy and girl now feels a strange feeling of strong sensation in the genitals and attraction towards the members of the opposite sex. At this stage they derive pleasure by self- stimulation of the genitals, may fall in love with one's own self by taking interest in beautifying and adorning their own body organs and may take interest in making sexual relations with the members of opposite sex. Thus their behaviour is now centered around the satisfaction of the sexual needs either through homosexual or heterosexual relationship.

In this way, Freud adopted a somewhat different and unique approach for knowing and understanding the mechanism of personality. However, some of his views, specially related to the dominance of sex motive, proved indigestible to the followers of his school of psycho - analysis. As a result his own disciples Alfred Alder and Carl Jung broke away from him to propound their own views on personality and human behaviour.

ANALYTICAL APPROACH OF JUNG

Carl Gustay Jung, another bright disciple of Freud, almost at the same while opposing his Guru, put forward a different approach for understanding personality and human behaviour, known by the term Analytical approach. The major concept of this approach may be summarized briefly as below : **Structure of the Psyche** : The structure of one's mind consists of one's conscious, the personal unconscious and the collective unconscious. The conscious is the seat of one's ego and conscious behaviour. Beneath it lies the personal unconscious - containing all the repressed material connected with one's private and personal life. The collective unconscious lies beneath the layer of one's personal unconscious. It is common and universal to all individuals contains the experiences of the whole race collected over millions of years specifically in the form of universal ideas or images called archetypes. These archetypes are available in abundance in old myths and fairy tales and folklore in religious and cultural traditions in enduring literature and art. Jung has named a variety of such archetypes like the mother archetypes, the father archetypes, the hero and the persona, the anima and the animus and the shadow and the self. As examples of these archetypes we may consider the mother archetypes, i.e. the image of the mother is always that of warm, loving, protective and nourishing almost everywhere in the world.

Self- actualization Motive: In his approach to understand human behaviour and personality, Jung emphasized that human behaviour is neither directed through the sex motive (as advocated by Freud) nor through the power motive (as advocated by Adler). Rather it is guided and directed by the motive or urge of self- actualization.

Each one of us tries in one's own way for expressing or actualizing one's own self. The way he is able to do so or the success or failure he gets in doing so decides his behaviour pattern and personality make - up.

Libido and Personality Development : Jung tried to give a very comprehensive meaning to the term 'libido' in contrast to the narrower meaning. i.e. sex gratification, assigned by Freud. He equated it with the life urge or life energy responsible for every type of human activity including, of course, sex gratification. Its normal flow makes an individual normal while its repression, blockage or damming up may lead to abnormalities. In the case of normal flow also, the personality of the individuals may be fashioned as introvert or extrovert. The persons in whom life energy (libido) flows inward are known as 'introverts' while, persons in whom the life energy flows outward are termed as 'extroverts'.

Personality Types : Based on the notion of libidinal flow of human life energy, Jung thus tried to divide human beings basically into two distinct types -Introvert and extrovert - according to their social participation and the interests which they take in social activities.

4.5 MEASUREMENT OF PERSONALITY.

Assessment of Personality

Everybody is curious to know about his own personality or that of others. We want to describe it and know what type of personality or the personality traits are possessed by us or others. It needs the knowledge and skill for the assessment or measurement of personality. There are various methods and techniques which can help us in this task. But before discussing these methods and techniques, let us first decide about using the terms assessment and measurement since it is often argued that personality can't be measured, it can only be assessed.

WHETHER PERSONALITY IS MEASURED OR ASSESSED?

The answer of this question lies in a question itself - Is the measurement of personality possible? If not then let us analyses difficulties that one faces while trying to measure it.

Difficulties in the Measurement of Personality

There are three basic elements involved in any process of measurement which are responsible for the success or failure of this process. They are -

i) Nature of the thing we want to measure.

ii) Nature of the instruments with the help of which we have to measure it.

iii) Nature of the person who is going to measure..

Let us evaluate the personality measures on the above criteria.

NATURE OF THE THING (PERSONALITY)

Nature of the thing (personality) is so complex that it is hardly possible to make it an object for measurement.Firstly,because, personality is not a thing, it is an idea, an abstraction. While attempting for its measurement, we wrongly try to give it a concrete shape. Secondly, what is there in the personality, which we want to measure, is not clear. Psychologists have no agreement about the dimensions or elements of the personality. Thirdly, personality is a dynamic phenomenon. It is not static. How can we measure a thing, which is ever in a process of change and modification? The measurement will certainly differ from time to time and hence it is not proper to call it measurement.

NATURE OF THE INSTRUMENTS

The process of measurement, in addition to the subject of measurement, requires the tools and the satisfactory units of measurement. In personality measurement, we also encounter difficulties in this direction such as:

a) There is no zero (starting point) for reference as the base of personality. After all, no child is born with zero personality.

b) In measuring a rod, we can measure it in terms of the units of length like centimetres, inches etc. In measuring temperature, we have units in terms of degrees but in psychological measurement, we do not have any such equal or regular unit of measurement.

c) For measurement, we require scales or measuring instruments that are exact, reliable and valid in terms of their results. In the field of personality measurement, we do not find such satisfactory instruments.

THE NATURE OF THE PERSON (EXAMINER)

To a great extent, the objectivity, reliability and validity in any process of measurement depends upon the competency and impartiality or objectivity on the part of the person who performs the task of measurement. Afterall he is a human being with his own beliefs, likes and dislikes, tastes and temperaments and hence we cannot check the influence of his subjectivity on any work of personality measurement.

In this way, the actual measurement (which defines itself in terms of objectivity, reliability and validity) of personality is not possible. Also it is very difficult to search for all the constituents or elements or personality, most of which are unknown.Moreover, prediction of the future status is the most essential aim of measurement. In case of a dynamic phenomenon like personality, such prediction is not possible and hence it is not justified to use the term measurement. We can only have the estimate or assessment of personality.

TECHNIQUES AND METHODS USED FOR THE ASSESSMENT OF PERSONALITY

The method used for the assessment of personality are often classified as (i) Subjective methods, ii) Objective methods, iii) Projective methods. But this classification suffers from many drawbacks. It is difficult to draw a straight line between subjectivity and objectivity, even projective techniques cannot be saved from the subjectivity and self-projection of the examiner. Actually speaking, there is nothing like absolute objectivity in these methods. Objectivity (if at all we can have it) is nothing but subjectivity pooled together.Therefore, it is proper to seek other ways of classifying the methods of personality assessment.

We can classify these techniques in the following five categories:

Firstly, there are techniques, where we can see how an individual behaves in actual life situations. The main techniques in this category are : (a) Observation technique, (b) Situation tests.

Secondly, there are techniques by which we can find what an individual says about himself. The main techniques in this category are : (a) Autobiography (b) Questionnaire and Personality Inventory (c) Interview.

Thirdly, there are techniques by which we can find what others say about the individual whose personality is under assessment. The main techniques in this class are :

(a) Biographies, (b) Case history method, (c) Rating Scales, (d) Sociometric techniques.

Fourthly, there are techniques by which we can find how an individual reacts to an imaginative situation involving fantasy. All kinds of projective techniques falls under this class.

Fifthly, there are techniques by which we can indirectly determine some personality variables in terms of physiological responses by machines and technical instruments.

Observation

Observation is a popular method to study the behaviour pattern of an individual in actual life situation. What personality traits or characteristics the observer needs to know are first decided by him and then he observes relevant activities of the subject in real life situations. The observation can be done in two ways. In one, the observer does not hide his presence. He rather becomes more or less a part of the group under observation. While in the other, he takes a position at a place where his presence is least disturbing to the group but from where he can observe in detail the behaviour of the individual under observation. To get a clear idea, the observer can make use of tape - recorder, photographic cameras, telescopic etc. To ascertain whether the observer can rely on the observed results, he can repeat observations in the same situation a number of times, or the subject may be observed by a number of observers and the results may be pooled together.

Situational Tests

Here the situation is artificially created in which an individual is expected to perform acts related to the personality traits under testing. For example, to test the honesty of an individual, some situations can be created and his reaction can be evaluated in terms of honesty or dishonesty. Does he feel temptation of copying? Does he try to pick up the one rupee note in a given situation? All such instances can lead towards the assessment of the trait of honesty in the individual.

QUESTIONNAIRE

Questionnaire can be understood by the following description:

Goode and Hatt (1953)

In general the word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself. This definition makes it clear that in collecting information from the subject himself about his personality characteristics, a form consisting of a series of printed or written questions is used. The subject responds to these questions in the space provided in the form under the columns yes, no or cannot say (?), etc. These answer are then evaluated and used for personality assessment. Items, like the following, are included in the questionnaires:

Do you enjoy being alone?	Yes, No, ? (not definite)
Do you enjoy seeing others successful ?	Yes, No, ? (not definite)

Do you laugh at a joke on you ? Yes, No, ? (not definite)

Do you get along well with your relatives ? Yes, No, ? (not definite)

It is the most popular method and is quite useful in collecting quantitative as well as qualitative information.

Personality Inventory

It resembles questionnaires in many aspects like administration,scoring, interpretation etc. The difference can be seen in two aspects.

Firstly, the questionnaire is a general device and can be used for collecting all kinds of information (not only connected with personality traits or behaviour of an individual). Personality Inventory is specially designed to seek answers about the person and his personality.

Secondly, the questions set in the questionnaire are generally addressable to the second person like:

Do you often feel lonely? Yes,No, ?

However, in the personality inventory, they are usually addressed to the first person such as:

I often feel lonely. Yes, No, ?

The best known Personality Inventory is the Minnesota Multiphasic Personality Inventory (MMPI). The questions, included in this inventory are such that their answers are known to Indicate certain specific personality traits. It consists of 550 items. Some of these items are presented below for illustration:

I sweat very easily even on cool days.

There is something wrong with my sex organs.

I have never been in love with any one.

I like to talk about sex.

Each item is printed on a separate card. The subject reads the questions and then, according to the category of his response - yes, no or doubtful - puts it down in the space provided for the purpose. With the help of these responses, evaluation in terms of the important personality traits can be obtained.

The questionnaire and Personality Inventory suffer from the following drawbacks:

i) It is difficult to get response to all the questions.

ii) The subject may give selected responses rather than the genuine one (hide his weaknesses) etc.

iii) He may be ignorant of certain traits or qualities which he may possess.

Rating Scale

Rating scale is used to know from others where an individual stand in terms of certain personality traits. Usually with the help of this technique, we try to have some specific idea about some of the personality traits of an individual (whom we do not know well), from someone, who knows him very well. It reflects the impression the subject has made upon the person who rates him. The three basic things involved in this techniques are.

- The specific trait or traits to be rated.
- The scale by which degree of possession or absence of the trait has to be shown.
- The appropriate persons or judges for rating.

First of all, the traits or characteristics, which have to be evaluated by the judge, are to be stated and defined clearly. Then a scale for rating work is to be constructed. How it is done can be understood through the following example. Suppose we wish to have rating on the 'Quality of Leadership' of the students of a class. We can have divisions of this quality into degrees such as very good,good,average,poor, very poor etc. Now the arrangement of these divisions along a line at equal intervals, from high to low or otherwise will be named as Rating Scale for assessing the quality of leadership. Usually the degrees are indicated by numbers, 1 to 3, 1 to 5 or 1 to 7, comprising three points or seven point scale. For example, A seven - point scale is of the following type.

7	6	5	4	3	2	1
Excellent	Very good	Good	Average	Below Average	Poor	Very poor

Now the raters, who are in a position to rate the individuals properly, can be asked to rate them and give them scores, ranging from 1 to 7, according to the degree of leadership they possess.

Rating techniques suffer from some drawbacks like subjective bias and halo effect. In the former, the rater may have his own likes and dislikes and this may colour his estimates about the individuals under rating, whereas under the halo effect, he may rate an individual (on the basis of general impression) to be more honest or likeable than his actual potentialities.

To bring some reliability it has been suggested that instead of having rating by

only one judge, we can assign the rating work to a number of judges, for example to different teachers, classmates, parents etc. who can pool in their judgments or ratings.

Interview

Interview is a technique of getting information directly from the subject about his personality in face - to - face contacts. It gives an opportunity for mutual exchange of ideas and information between the subject and the psychologists. For this purpose, the psychologist tries to fix a face - to - face appointment with the person or persons under assessment. He makes sure of the personality traits or behaviour he has to assess and then he plans accordingly.Usually, a list of questions to be put is prepared and after taking the subject into confidence, the psychologist tries to seek answers to his pre-planned questions. He not only takes care of the content of the response but the tone behaviour and other similar factors, are also kept in mind for the proper evaluation of the desired personality pattern of the individuals.

The limitations of this techniques are that it needs a well - trained competent interviewer. It is costly in terms of labour, time and money. It also suffers from the subjective bias of the interviewer. Here again, like questionnaire and personality inventory, we cannot have any safeguard to stop the subject to hide his feeling or to respond in terms of selective answers. On the credit side, cent percent answers to the questions put to the subject, are obtained through interview. There is very little danger of not getting answers to the questions and moreover we can get the most confidential information from the subject which he would have otherwise hesitated to reveal through writing.

In fact, interview is a relatively more flexible tool. It permits explanation, adjustment and variations according to the situation and thus proves one of the essential and important tools for personality assessment.

Projective Techniques

So far we have discussed only those techniques which usually evaluated the overt or conscious behaviour of an individual. The covert or unconscious behaviour is not so insignificant; rather it is more significant than the former, as Freud believes that our conscious behaviour is only one - tenth of the total behaviour.Therefore, there should be some other techniques which not only emphasizes the observable part of the human personality but can reveal the inner or private world and go deeper in the unconscious behaviour of an individual to unearth the repressed

feelings,wishes,desires,fear, hope and ambitions.

Project!ve techniques are devised to accept the challenge. They try to assess the total personality of an individual and not in fragments. Let us see what these techniques are.

WHAT ARE THE PROJECTIVE TECHNIQUES?

These techniques are based on the phenomenon of projection. In these techniques relatively indefinite and unstructured stimuli (like vague pictures, ink - blots, incomplete sentences, etc.) are provided to the subject and he is asked to structure them in any way he likes. In doing so he unconsciously projects his own desires,hopes, fears, repressed wishes etc. and thus not only reveals his inner or private world but gives a proper clue to estimate his total personality.

The common Projective Techniques are:

THE RORSCHACH INK -BLOT TEST

This technique has been developed by Swiss psychologist, who was the son of an art teacher Mr. Harmans Rorschach. Material of the test consists of 10 cards with ink blots. Five of them are in black and white and five are multi-coloured. These ink-blots are completely unstructured, that is the shapes of the blots do not have any specific meaning.

The test demands a lot of training and skill in scoring and interpretation on the part of administrator and therefore, the work should be considered as a serious one and should only be done by an experienced and trained psychologist.

TAT OR THEMATIC APPERCEPTION TEST

The TAT consisting of perception of a certain picture in a thematic manner is called TAT or Thematic Apperception Test. This test was developed by Murray and Morgan.

Test material and administration : It consist of 30 pictures which portray human beings in a variety of actual life situations. Ten of the cards are meant for males, 10 for females and 10 for both. In this way, the maximum number of pictures used with any subject is 20. The test is usually administered in two sessions, using 10 pictures in each session. The pictures are presented one at a time. They are vague and indefinite. The subject is told clearly that this is a test of creative imagination and that there is no right and wrong response. He has to make up a story for each of the pictures presented to him, within a fixed time. He has to take care of the following aspects while knitting the story :

(i) What is going on the picture ?

(ii) What has led to this scene ?

(iii) What would happen in such a situation ?

In making up the stories the subject unconsciously projects so many characteristics of his personality. There is no time to think. Therefore, the stories express his own life - natural desires, likes and dislikes, ambitions, emotions, sentiments etc. Its special value resides in its power of exploring the underlying hidden drives, complexes and conflicts of the personality. An expert examiner can know much about the personality of his subject by carefully interpreting the given responses.

CAT (CHILDREN APPERCEPTION TEST)

TAT test works well with adults and adolescents but for children it is not suitable. For children between 3 to 10 years, the CAT was developed by D. Leopold Bellak.

Description of the Test : It consists of 10 cards. The cards have pictures of animals instead of human characteristics since it was thought that children could identify with animal figures more readily than with persons. These animals are shown in various life situations. For both sexes, all the 10 cards are needed. The pictures are designed to evoke fantasies relating to a child's own experiences, reactions and feeling. Whatever story the child makes, he projects himself. It is a collusc - free test but it demands some alterations to the child's local conditions.

Administering the test : All the 10 cards are presented one by one and the subject is asked to make up stories on them. The child should have confidence and he should consider story - making a pleasant game.

With all this knowledge an expert interpreter can pronounce judgement on the various aspects of the child's personality.

SENTENCE - COMPLETION TESTS

These tests include a list of incomplete open - ended sentences, which require completion by the subject in one or more words. The subject is asked to go through the list and answer as quickly as possible (without giving a second thought to his answer). For example, we can have the following sentences :

I am worried over.....

My hope is.....

I feel proud when.....

My hero is.....

Through this test, a greater flexibility and variety of responses and more area of personality and experiences may be selected.

In addition to the projective techniques mentioned above, there are some others which may prove useful in many situations. These are play technique, drawing and painting tests etc. Both these techniques are very useful in the case of small children. In the former, the examiner observes the spontaneous behaviour of the children while playing or constructing something with the help of given material and in the latter, the natural free hand drawing and paintings of the children are the matter of the study. Both these techniques provide a good opportunity for the careful analysis of a child's personality.

4.6 CONCEPT AND CAUSES OF INDIVIDUAL DIFFERENCES IN CLASSROOM.

Every individual on this earth is different from the other. No one person is fully like other person. Every person differs from the other, either physically or psychologically. Even thetwins are no exception to this. They differ in some aspects or other. Particularly whenwe look at people from psychological point of view these differences are quite obvious. In many instances even the children differ from their parents. They will have some similarities with some forefathers or grandparents instead oftheir parents. What makes these differences to exist? What are the causes? The answerto these queries can be traced from two factors, viz., heredity and environment.

Meaning of Individual Differences: Skinner, C.E.:

"Today we think of individual differences as including any measurable aspect of the total personality." It is clear from this definition of individual differences that it comprehends every aspect of human personality which is in some manner measurable.

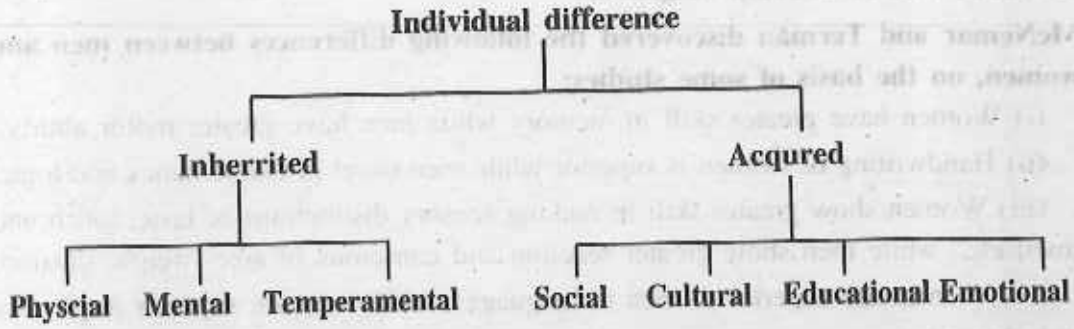
Dissimilarity is principle of nature. No two persons are alike. All the individuals differ from each other in many a respects. Children born of the same parents and even the-twins are not alike. This differential psychology is linked with the study of individual differences. Wundt, Cattel, Kraepelin, Jastrow and Ebbing Haus are the exponents of differential psychology.

This change is seen in physical forms like in height, weight, colour, complexion strength etc., difference in intelligence, achievement, interest, attitude, aptitude, learning habits, motor abilities, skill. Each man has an intellectual capacity through which he

gains experience and learning.

Every person has the emotions of love, anger, fear and feelings of pleasure and pain. Every man has the need of independence, success and need for acceptance.

Broadly individual difference may be classified into two categories such as inherited traits and acquired traits. The classification tree below gives a clear understanding of the different sub-types :



Types of Individual Differences:

1. Physical differences:

Shortness or tallness of stature, darkness or fairness of complexion, fatness, thinness, or weakness are various physical individual differences.

2. Differences in intelligence:

There are differences in intelligence level among different individuals. We can classify the individuals from super-normal (above 120 I.Q.) to idiots (from 0 to 50 I.Q.) on the basis of their intelligence level.

3. Differences in attitudes:

Individuals differ in their attitudes towards different people, objects, institutions and authority.

4. Differences in achievement:

It has been found through achievement tests that individuals differ in their achievement abilities. These differences are very much visible in reading, writing and in learning mathematics.

These differences in achievement are even visible among the children who are at the same level of intelligence. These differences are on account of the differences in the various factors of intelligence and the differences in the various experiences,

interests and educational background.

5. Differences in motor ability:

There are differences in motor ability. These differences are visible at different ages. Some people can perform mechanical tasks easily, while others, even though they are at the same level, feel much difficulty in performing these tasks.

6. Differences on account of gender:

McNemar and Terman discovered the following differences between men and women, on the basis of some studies:

(i) Women have greater skill in memory while men have greater motor ability.

(ii) Handwriting of women is superior while men excel in mathematics and logic.

(iii) Women show greater skill in making sensory distinctions of taste, touch and smell etc., while men show greater reaction and conscious of size- weight illusion.

(iv) Women are superior to men in languages, while men are superior in physics and chemistry.

(v) Women are better than men in mirror drawing. Faults of speech etc. in men were found to be three times of such faults in women.

(yi) Women are more susceptible to suggestion while there are three times as many colour blind men as there are women.

(vii) Young girls take interest in stories of love, fairy tales, stories of the school and home and day-dreaming and show various levels in their play. On the other hand boys take interest in stories of bravery, science, war, scouting, stories of games and sports, stories and games of occupation and skill.

7. Racial differences;

There are different kinds of racial differences. Differences of environment is a normal factor in causing these differences. Karl Brigham has composed a list on the basis of differences in levels of intelligence among people who have migrated to United States from other countries.

On the basis of these average differences between the races, the mental age of a particular individual cannot be calculated since this difference is based on environment.

8. Differences due to nationality:

Individuals of different nations differ in respect of physical and mental differences, interests and personality etc. 'Russians are tall and stout'; 'Ceylonese are short and

slim'; 'Germans have no sense of humour'; 'Yellow races are cruel and revengeful'; 'Americans are hearty and frank'; Indians are timid and peace-loving' and the like observations enter into our common talk.

9. Differences due to economic status:

Differences in children's interests, tendencies and character are caused by economic differences.

10. Differences in interests:

Factors such as sex, family background level of development, differences of race and nationality etc., cause differences in interests.

11. Emotional differences:

Individuals differ in their emotional reactions to a particular situation. Some are irritable and aggressive and they get angry very soon. There are others who are of peaceful nature and do not get angry easily. At a particular thing an individual may be so much enraged that he may be prepared for the worst crime like murder, while another person may only laugh at it.

12. Personality differences:

There are differences in respect of personality. On the basis of differences in personality, individuals have been classified into many groups.

Spranger, for example, has classified personalities into six types:

(a) Theoretical,
(b) Economic
(c) Aesthetic,
(d) Social,
(e) Political, and
(f) Religious.

Jung classified people into three groups:

(a) Introverts,
(b) Extroverts, and
(c) Ambiverts.

Trottor divided individuals into:

(a) Stable minded, and

(b) Unstable minded.

Jordon thinks of personalities into:

(a) Active, and

(b) Reflective type.

Thorndike has classified people into four categories on the basis of thinking:

(a) Abstract thinkers,

(b) Ideational thinkers,

(c) Object thinkers, and

(d) Thinkers in whom sensory experience is predominant.

Terman has classified people into nine classes according to their level of intelligence:

(a) Genius,

(b) Near genius

(c) Very superior,

(d) Superior,

(e) Average,

(f) Backward,

(g) Feebleminded,

(h) Dull, and

(i) Idiot.

It is an admitted fact that some people are honest, others are dishonest, some are aggressive, others are humble, some are social, others like to be alone, some are critical and others are sympathetic. Thus we see that the differences in personality are dependent on personality traits. Teacher should keep in mind these differences while imparting education to the pupils.

Causes of Individual Differences:

There are various causes which are responsible in bringing individual differences.

They are narrated below:

i. Heredity:

Some heredical traits bring a change from one individual to other. An individual's height, size, shape and color of hair, shape of face, nose, hands and legs so to say the entire structure of the body is determined by his hereditical qualities. Intellectual differences are also to a great extent influenced by hereditary factor.

ii. Environment:

Environment brings individual differences in behaviour, activities, attitude, and style of life characteristics. Personality etc. Environment does not refer only physical surroundings but also it refers the different types of people, society, their culture, customs, traditions, social heritage, ideas and ideals.

iii. Race and Nationality:

Race and Nationality is one cause of individual difference. Indians are very peace loving, Chinese are cruel; Americans are very frank due to race and nationality.

iv. Gender :

Due to gender variation one individual differs from other. Men are strong in mental power. On the other hand women on the average show small superiority over men in memory, language and aesthetic sense. Women excel the men in shouldering social responsibilities and have a better control over their emotions.

v. Age:

Age is another factor which is responsible in bringing individual differences. Learning ability and adjustment capacity naturally grow with age. When one grows in age can acquire better control over our emotions and better social responsibilities. When a child grows then this maturity and development goes side by side.

vi. Education :

Education is one major factor which brings individual differences. There is a wide gap in the behaviors of educated and uneducated persons. All traits of human beings like social, emotional and intellectual are controlled and modifies through proper education.

This education brings a change in our attitude, behaviour, appreciations, Personality. It is seen that uneducated persons are guided by their instinct and emotions whereas the educated persons are guided by their reasoning power.

Educational Implications of Individual Differences:

Educational implications of Individual differences are listed below:

I. Aims of education, curriculum, method of teaching should be linked with individual differences considering the different abilities and traits individual.

ii. Curriculum should be designed as per the interest, abilities and needs of different students.

iii. The teacher has to adopt different types of methods of teaching considering individual difference related to interest, need, etc.

iv. Some co-curricular activities such as Drama, music, literary activities (Essay & Debate Competition) should be assigned to children according to their interest.

v. Teacher uses certain specific teaching aids which will attract the children towards teaching considering their interest and need.

vi. Various methods such as playing method, project method, Montessori method, story telling methods are to be used considering/discovering how different children respond to a task or a problem.

vii. The division of pupils into classes should not be based only on the mental age or chronological age of children but the physical, social and emotional maturity should be given due consideration.

viii. In case of vocational guidance the counselor is to plan the guidance technique keeping in view the needs and requirements of the students.

Role of Individual Differences in Education:

One of the important objectives of modern education is the complete development of the individual. Individuals have different goals, different interests, different emotional problems and different abilities. We cannot afford to ignore these individual differences in imparting education to children. Since school work is planned on group basis it presents a formidable challenge to all teachers.

Hence some practical procedures for adapting school work to individual differences are suggested:

1. Limited size of the class:

Generally, there are 50 or more than 50 students in a class. In such a large class, it is not possible for the teacher to pay individual attention to the students. The size of the class should be small. It should be divided into various units so that after class-room work their various difficulties may be found out.

2. Proper division of the class:

Now there are separate classes for the students, who have different intelligence. While bringing about this classification, the teacher should keep in mind the difference in age, interests, emotional and social qualities.

3. Home task:

The teacher should assign home task to the students while keeping in view the individual differences.

4. Factor of gender

Boys and girls are to play different roles in society. Hence the factor of sex should be kept in mind.

5. Curriculum:

The curriculum should be modified to suit the needs of all types of children. A large number of subjects should be included in the curriculum so that education can be provided to each child according to his interests, needs and abilities. Curriculum should not be rigid but it should be flexible.

If we lay down the same curriculum for all the students, the brilliant students will not be able to have full mental diet, and the backward students and the students of lower I.Q. will lag far behind in the class, and they may start playing truancy from the school.

6. Methods of Teaching:

Methods of teaching should be chosen on the basis of individual differences. It is not advisable to use the same method of education in the case of all children-gifted or backward.

7. Educational Guidance:

Teacher should impart educational guidance to the students while keeping in.view their individual differences. He can assist them in the selection of educational career, selection of subjects, selection of books, selection of hobbies and co-curricular activities and in many other areas connected with education.

8. Vocational Guidance:

While keeping in view the individual differences the teacher can guide the students in the vocation that they should adopt.

9. Individual Training:

Many plans and techniques for individualizing instructions have been advocated. **Some of these plans are as under: (i) Dalton Plan:**

This plan was introduced by Miss Helen Parkhurst at Dalton. According to this plan, the school is regarded as a 'children house.' The principles underlying the plan are freedom, co-operation and allocation of time. The pupils are free to continue without interruption the work in which they are absorbed, unhindered by time tables.

They are not taught in classrooms. They are given subjects that suit their interests. The advantage of this plan is that each pupil is allowed to proceed at his own rate and in accordance with this individual ability. Thus the instructions are completely individualized.

(ii) Morrison Plan:

This Plan was devised by Professor H.Q. Morrison of the University of Chicago. This plan is based on directed guidance and stresses unit assignment. To establish learning unit is an important task in the Morrison plan. The plan is based on individual needs and interests.

(iii) Winnetka Plan:

This plan was instituted by C.W. Washburne in the school of Winnetka, Illinois. This plan is based on the principle that the pupils should be allowed to follow his own rate of learning in each of the subjects of his curriculum. Before instituting this plan it is observed through an examination that how much an individual already knows. On the basis of it, specific learning unit is planned for him.

Progress is checked by the pupils himself by means of self-administered tests. The advantages of this plan are that the backward and the intelligent are to proceed at their own rates. Moreover, there are no failures since the pupil is measured against his own progress.

(iv) Contract Plan:

In this plan, the subjects of study are determined like the Dalton method; the pupil's progress is measured through tests like the Winnetka method. Thus this plan is a synthesis of Dalton and Winnetka methods.

(v) Project method:

This method was suggested by Kilpatrick. In this method each member of the group can work in terms of his interest and ability. Hence this method is also in the direction of individualization of instructions.

4.8 Let Us Sum Up

In this unit we have studied the Concept, Definition, Meaning, Traits and Types of Personality. Personality of an individual cannot be measured, where as it can only be analysed,appraised or assessed. This is because, personality is an abstract, multidimensional, holistic in assumption, dynamic, complex, individual and situation specific. As a whole it is the sum total of many traits or qualities possessed to different degrees in differentindividuals.

Personality inventories are used where individuals are required to give details about themselves. They are different from general questionnaires. A few very significant personality inventories are:

- Cattell 16 P.F Inventory
- Eysenck Personality Inventory
- Minnesota Multipurpose Personality Inventory (MMPI) Projective Techniques are used when covert or unconscious behavioural dispositions are to be analysed. They are based on the phenomena of projection to test the total personality and not in fragments. A few commonly used and significant projective techniques are:
- The Rorrchach Ink-blot test
- Thematic Apperception Test (TAT)
- Children's Appreciation Test (CAT)
- Picture Completion Test (PCT)

4.9 Unit end exercise

1. What is personality?
2. What are the types personality?
3. What is heredity?
4. What is environment?
5. What is the role of heredity and environment in the process of child development?
6. Explain Freud's theory of Personality.
7. Differentiate between 'Anal' and 'Oral' stages.
8. Discuss Cattell's 16 PF Trait Theory.
9. How personality can be measured?

10. What is CAT?
11. What is TAT?
12. Name two important projective tests of personality.
13. What are the factors that influence personality?

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Unit - 5 ❑ Pedagogical Approaches

Structure

5.1 Introduction

The word 'Education' has been derived from the Latin word 'Educare'. Meaning of 'Educare' is to bring up or to raise the child mentally and physically.

In other words, it means to lead out the best in the child or to guide. Others are of the opinion that education is derived from Latin word 'Educatum' which means the act of teaching or training.

Operationally, Education can be defined as an overall development of a complete personality. Educationists are defining education in various dimensions. So, for all round development of child education is important which comes through teaching and learning. In this context, they used the term pedagogy which means teaching and learning both.

Pedagogy is a term used in educational writing but its meaning is assumed to be self- evident. Many of the strategies that have been developed to redress inequity in school have targeted classroom practice and teaching as an important site of change.

5.2 Objectives

After completing this unit, learners will be able to :

- know the concept of pedagogy;
- understand the meaning of critical pedagogy;
- know about the relation between teaching and learning;
- have knowledge regarding the lesson plan.

5.3 Concept of Pedagogy

Pedagogy deals with the theory and practice of teaching and it effects on the learning of students. Pedagogy explains teaching actions, judgments and teaching techniques by considering the 'theory of learning', understandings of students and their needs and the backgrounds and interests of individual students. It aims furthering liberal education.

The teaching of adults, as a specific group, is referred to as **'Aandrogogy'**.

Pedagogy, is the art and science of teaching children. In modern day usage, it is a synonym for 'teaching' or "education," particularly in scholarly writings. Throughout

history, educators and philosophers have discussed different pedagogical approaches to education, and numerous theories and techniques have been proposed. Educators use a variety of research and discussion about learning theories to create their personal pedagogy and are often faced with the challenge of incorporating new technology into their teaching style. Successful education for all depends on teachers being able to embrace both the art and science of pedagogy, acting as parents who understand the needs, abilities, and experiences of their students being trained in the best methods of communication and presentation of appropriate materials.

Pedagogy is an art

From the very beginning education was given the status of art — the art of teaching, of leading children to knowledge which shows that the profession of educator first started in Ancient Greece. Before that, the slaves were performing the role of educator. The slaves were engaged to take the master's children to school, take care of their physical appearance and take part during the play. Socrates was considered to be the founder father of education. (5th century BC).

Pedagogy is a science

The development of scientific field as sociology and psychology is accompanied by the emergence of pedagogy as an applied science. Pedagogy is now treated as a science with the feeling that it guides the process of teaching and learning. So, it is a field of science that tells us how to teach. It's not coincidence that we have used the subjunctive mood here, since pedagogy – as the science of teaching and learning – is not a fully-formed discipline, thereby leaving room for other educational sciences, a plural science. It became clear over time that the exotic science known as "Pedagogy" could not be soluble there.

Pedagogy is an applied science

Now a days pedagogy has been accepted has an "applied science," that is, as a discipline geared towards the practical application of acquired knowledge. Pedagogy is the history of pedagogues or it is the history of practitioners and theorists of the instructional process as per Jean Houssaye.(LEPOLE, 2018) And they are the men and women "engaged in the actual educational process, using both theoretical concepts and practical skills combined in such a way as to obscure the extent to which the practical skills employed in the educational process are more important than theoretical concepts, and vice versa."

ALLIED CONCEPTS

5.3.1 Teaching

Concept of Teaching

A concept is meeting but the image formed regarding an object, people or idea. It is the result of our direct and indirect experiences which we gain about objects, people or ideas and it is same for the concept of teaching. Concept of teaching means all those which we know about teaching in terms of its meaning, it froms the other similar concepts and activities. Hence, to know regarding the concept of teaching in totality, we have to look it from the following angles:

- Understanding its meaning and defining it;
- Knowing about the nature and characteristics of teaching;
- Comparing teaching with other similar concepts;
- Knowing about the relationship between teaching and learning;
- Discussing about the analytical concept of teaching.

Meaning and Definitions of the Term Teaching

Teaching is nothing but either an occupation or profession of a group known as teacher. Also it is an activity of a group undertaken to help an individual to learn or acquire some knowledge, skills, attitudes or interests. However, it is very complex social, cultural and ethical process designed in a social or cultural context.

Since, it is designed within a social context and, therefore, is related to the social structures, cultural environment, values and ideals of the people, society and the government. All these factors always have flexibility and dynamism. So, the meaning and definition of teaching always change depending on the need of time, place and society. Due to this various definition of teaching are as follows:

H.C. Morrison (1934): Teaching is an intimate contact between a more mature personality and a less mature one which is designed to further the education of the latter. (Khan, 2011)

John Brubacher (1939): Teaching is an arrangement and manipulation of a situation in which there are gaps and obstruction which an individual will seek to overcome and from which he will learn in the course of doing so. (Khan, 2011)

B.O. Smith (1960): Teaching is a system of actions intended to product learning. (Khan, 2011)

N.I. Gage (1962): Teaching is a form of interpersonal influence aimed at changing the behaviour potential of another person. (Khan, 2011)

B.O. Smith (1963): Teaching is a system of actions involving an agent, an end in view, and a situation including two sets of factors – those which the agent has no control (class size, size of classroom, physical characteristics of pupils etc.) and those that he can modify (way of asking questions about instruction and ways of structuring information or ideas gleaned.) (Khan, 2011)

Edmund Amidon (1967): Teaching is defined as an interactive process, primarily involving classroom talk which takes place between teachers and pupils and occurs during certain definable activities. (Khan, 2011)

Clarke (1970): Teaching refers to activities that are designed and performed to produce change in student (pupil) behaviour. (Khan, 2011)

Thomas F. Green (1971): Teaching is the task of a teacher which is performed for the development of a child. (Khan, 2011)

5.3.2 Instruction

For any activity or work, instruction is a must, and for education, it plays the vital role. It is nothing but the transfer of learning from one person to another. By instruction, direction is given and told how to do something.

The term *instruction* is often used to describe the most rudimentary programming commands. For example, a computer's *instruction set* is the list of all the basic commands in the computer's machine language.

Relation between Teaching and instruction

Education is the result of going to school and learning values and acquiring culture where as Instruction is when you teach someone how to do a particular thing. Teacher when teaches about any subject in various methods, then it is called 'teaching'. But when the teacher directs the students how they can implement this in various processes then it is known as 'instruction'. For example, teaching medicine, carpentry or management.

Teaching vs. Instruction

Teaching and instruction are mutually exclusive. Soldiers are instructed, students are taught. An equipment manual contains instructions. An instructor lays down rules to be obeyed; a teacher strews ideas to be subverted. Instructions prescribe; teaching provokes. Instruction is regimentation; teaching is liberation.

The name "instructor" is potentially fatal to a teacher's teaching: it encourages data feeding into dull automata, rather than the stimulation of independent minds.

Fundamental to the notion of "instruction" is the doctrine that students must believe what teachers say. Fundamental to teaching is that they should question and quarry and challenge and harry it.

5.3.3 Indoctrination

When ideas, doctrines, attitudes and cognitive approaches are forcibly applies then the process is called Indoctrination. Humans are social animal inescapably shaped by cultural context, and thus some degree of indoctrination is implicit in the parent–child relationship, and has an essential function in forming stable communities of shared values.

Education is a process which involves in seeking the facts and learning the truth and then act. But indoctrination, people are influenced to believe facts without their operation; one can be indoctrinated into a political party, a cult or a belief system.

Relating teaching and Indoctrination

Education involves in seeking facts and learning about what is the truth and what is not. Indoctrination is aimed at influencing people to believe in facts, without being able to back up these newfound facts with anything but opinion.

5.3.4 Conditioning

Conditioning, in physiology, is a behavioural process whereby a response becomes more frequent or more predictable in a given environment as a result of reinforcement. Early in the 20th century, through the study of reflexes, physiologists in Russia, England, and the United States developed the procedures, observations, and definitions of conditioning. After the 1920s, psychologists turned their research to the nature and prerequisites of conditioning.

Conditioning is a form of learning. In this process, in which-

(1) a given stimulus (or signal) becomes increasingly effective in evoking a response or

(2) a response occurs with increasing regularity in a well-specified and stable environment. The outcome will be determined by the type of reinforcement applied. When two stimuli are presented in an appropriate time and intensity relationship, one of them will eventually induce a response resembling that of the other. The process can be described as one of stimulus substitution. This procedure is called classical (or respondent) conditioning. Three types of learning are- **i) classical conditioning, ii) operant conditioning**, and iii) **observational learning**. Both classical and **operant**

conditionings are forms of associative **learning**, in which associations are made between events that occur together.

Operant conditioning differs from classical conditioning in which reinforcement occurs only after the organism executes a pre-designated behavioral act. When no US is used to initiate the specific act to be conditioned, the required behaviour is known as an operant. When it occurs regularly, it is also regarded as a conditioned response. B.F. Skinner, the American psychologist, studied spontaneous (or operant) behaviour through the use of rewards (reinforcement) or punishment. For example, a hungry animal will respond to a situation in a way that is most natural for that animal. If one of these responses leads to the reward of food, it is likely that the specific response which led to the food reward will be repeated and thus learned. The behaviour that was instrumental in obtaining the reward becomes especially important to the animal. The same type of conditioning can also be applied to an action that allows the animal to escape from or avoid painful or noxious stimuli.

5.3.5 Andragogy

Andragogy is methods and principles used for adult education. The word comes from the Greek *andr-*, meaning "man", and *agogos*, meaning "leader of"; which means "leading man" and "pedagogy" means "leading children".

Two primary understandings of "andragogy" are:

1. The science of understanding (theory) and supporting (practice) lifelong education of adults.
2. It is a specific theoretical and practical approach. Humanistic concept of self-directed and autonomous learners as well as teachers as facilitators of learning is the base of this approach. The term also invites other definitions such as as *"adult education practice", "desirable values", "specific teaching methods", "reflections", and "academic discipline"*, with many authors claiming it to be better than traditional adult education.

Some authors used this term to allow discussion of contact between self-directed and self-taught education.

5.4 Concept of Critical Pedagogy

Introduction

The teachers, who are able to embrace both the art and science of pedagogy, may provide successful education. They are act as "parents" who understand the needs,

abilities and experiences of their students. They are also to be trained in the best methods of communication and presentation of appropriate materials.

To bring out the possibilities of intelligence and love of learning from their students, educators have tried to find interesting ways from the very beginning.

Critical Pedagogy (CP) is an approach to language teaching and learning. According to Kincheloe, it is concerned with transforming relations of power which are oppressive and which lead to the oppression of people. It tries to humanize and empower learners. It is most associated with the Brazilian educator and activist Paulo Freire. He used the principals of critical theory of the Frankfurt school as its main source.

Critical Pedagogy comes from critical theory, which is concerned with the idea of a Society in which people have political, economic, and cultural control of their lives. "Thinkers of critical theory believe that these goals are satisfied only through emancipating oppressed people which empowers them and enables them to transform their life conditions. It is the first step for critical pedagogy. The major hurdle of critical pedagogy is with criticizing the schooling in capitalist societies. As per Gor awareness raising and rejection of violation and discrimination against people are the major goals of critical pedagogy.

The most celebrated critical educator Paulo Reglus Neves Freire influenced critical pedagogy very much. Freire was a Brazilian educator and philosopher who was a leading advocate of critical pedagogy. He is best known for his influential work, *Pedagogy of the Oppressed*, which is considered one of the foundational texts of the critical pedagogy movement.

Paulo Freire (1921-1997)

Freire considers the students' ability to think critically about their educational situation. This type of approach allows them to "recognize connections between their individual problems and experiences and the social contexts in which they are embedded".

Paulo Freire contributed a philosophy of education that came not only from the more classical approaches stemming from Plato, but also from modern Marxist and anti-colonialist thinkers. In many ways his *Pedagogy of the Oppressed* (1970) may be best read as an extension of, or reply to, Frantz Fanon's *The Wretched of the Earth* (1961), which emphasized the need to provide native populations with an education which was simultaneously

new and modern (rather than traditional) and anti colonial (not simply an extension of the culture of the colonizer). The basic characteristics of critical pedagogy are given below:

Critical Pedagogy and the Educational Process

As per Vandrick, The major goal of critical pedagogy (CP), is to emancipate and educate all people regardless of their gender, class, race, etc. Gadotti (1994) also feels that pedagogy is of major interest for Freire by which he seeks to change the structure of an oppressive society. In Kanpol's views, CPrests on the belief that every citizen deserves an education which involves understanding the schooling structure by the teacher that would not permit education to ensue. Freire (1970) distinguishes between banking education and problem posing education. In the traditional view of education, teachers know everything and the students know nothing. Teachers deposit knowledge in students and never ask them to question that knowledge. The students comply whatever content the teacher chooses. Teacher is authority and students are obedient to authority. In this model students are the receivers. They receive, memorize and repeat. They are not asked to use this knowledge to the current problems and injustices in the society and improve the society. They get a positive role in this approach. Freire terms this approach as *banking model of education* because it is like depositing of money in a a bank. This model mirrors the structure of an oppressive society in which the oppressed and the oppressors are divided. It advocates fixation of reality. So it is a vehicle for continuing the political oppression and working against liberation or emancipation. (Aliakbari1, M. & Faraji, E. 2011)

a) Banking Model of Education

Banking model of education is the education in which the student is viewed as an empty account to be filled by the teacher. Freire is best known for his attack on this "banking" concept of education. He feels that it converts students into receiving objects. This model attempts to control thinking and action of students which forces them to adjust to the world and inhibiting their creative power. Scholars like Ruousseau and John Dewey expressed their concern about passive learning mechanism before Feire put forward his idea of critical pedagogy. John Dewey strongly criticized the idea of transmission of mere facts as a goal of education. He described education as a mechanism for social change. Freire's work, however, updated the concept and placed it in context with current theories and practices of education, laying the foundation for what is now called critical pedagogy.

b) Culture of Silence

According to Freire, the system of dominant social relations creates a 'culture of silence' that instills a negative, silenced and suppressed self-image into the oppressed. The learner must develop a critical consciousness in order to understand that this culture of silence is created to oppress. A culture of silence can also cause the "dominated individuals [to] lose the means by which to critically respond to the culture that is forced on them by a dominant culture." Social domination of race and class are interlaced into the conventional education system, through which the "culture of silence" eliminates the "paths of thought that lead to a language of critique.

To fulfill the goal of creating not only a better learning environment, but also a better world, Freire's practice required implementation of a range of educational practices and processes. He himself is of the opinion that this was not merely an educational technique but a way of living in our educative practice.

As per critical demographic theory, education or learning as an on-going, two-way, dialectic process that is built around the experiences of the student and allows for critical thinking and action to help students *grow*. In a truly democratic school, students are given the chance to express their views on the basis of their experiences and interests which are given due respect while planning for their continuing growth. Traditional hierarchies must be broken down and teachers must also be learners (particularly learning from their students) and being critically reflective about their practice to bring about *conscientization*. Teachers become facilitators to help students as they: share experiences and learn from each other; undertake critical inquiry and create their own plans of action. The importance of dialogue (between students, teachers, administration, parents and community) must be given priority. Tension between opposing conditions (subject and object, the individual and world, the word and the world) is seen as barrier for growth. As Freire states "the subjectivity and objectivity thus join in a dialectical unity producing knowledge in solidarity with action, and vice versa."

c) Curriculum and Authentic Materials

In CP, curriculum is based on the idea that there is no one methodology that can work for all populations. Bartolome feels that since all decisions related to curricular and material to be studied are based on the needs and interests of students, so there is not fixed curriculum or a programme. Degener also feels that on the basis of the experiences and realistic of their lives, the curriculum is framed. This curriculum is transformative,

that is, it fosters students' acquisition of the necessary strategies and skills that help them become social critics who are to make decisions which affect their social, political, and economic realities. Kessing- Styles (2003) also confirms that CP covers understanding curriculum as political text at the center of which, she believes, lies the social and political critics of everyday life.

On the basis of authentic materials such as TV, commercials, video movie, etc. (Which are representative of the culture that are to be examined by the students), CP lesson plan should be prepared. Kincheloe argues that texts and their themes should be provided by both teachers and students who bring their experiences for study and place that knowledge with the context in which they work. According to Okazaki , the content should be immediate and meaningful to students in order to make them aware of both the reproductive nature and the possibility of resistance to problematic content. The authentic materials help students link their knowledge to existing problems in society and take necessary actions for its improvement. This transformation practices help students develop skill in reflection and action that allows them to recognize and work against oppressive conditions in society. Ares feels that special attention is required to be paid to students' cultural heritage, practices, knowledge, and languages for enabling transformative practice. It is also emphasized that the aim of transformative practice is social information.

d) Critical Pedagogy and the Role of Teacher and Student

In this approach teachers are viewed as problem posers. However Dewey feels that learning through problem solving and practical application leads students to take a more active role in determining their experiences and positions within society. Kincheloe and McLaren (1994) maintain that teacher must empower his or her students by raising their awareness of reproducing process of an inequitable status quo in schooling and offer societal institutions. As per Giroux, the teachers are *Transformative Intellectuals* who have the knowledge and skill to critique and transform existing inequalities in society. This role is learn from students, appreciate their viewpoints and to take part in the dialogical process. As per Giroux, by creating appropriate conditions, teachers by creating appropriate conditions, teachers enable students to become cultural producers who can rewrite their experiences and perceptions. They also help students learn from each other and to theorize and understand how to question the authoritarian power of the classroom.

e) Critical Pedagogy and Praxis

The purpose of the educator and the educated, the leader and the followers in a dialogue between equal partners is called praxis. It is defined as "the self-creative activity through which we make the world. The requirements of praxis are theory both relevant to the world and nurtured by actions in it, and an action component in its own theorizing process that grows out of practical and political grounding". Bridging the gap between theory and transformational action in the aims of Praxis in education that means the connection of education with social transformation is done by praxis. According to Freire, praxis is action and reflection, interpretation and change. He also thinks, Critical consciousness is brought about not through intellectual effort alone but through praxis.

5.5 Science of Teaching- Relation between Teaching and Learning

Introduction

Scientific teaching is a pedagogical approach used in undergraduate science classrooms whereby teaching and learning is taught with the same rigor as science itself. According to a 2004 Policy Forum in Science magazine, "scientific teaching involves active learning strategies to engage students in the process of science and teaching methods that have been systematically tested and shown to reach diverse students."

What is Science?

As per Kothari Commission's report, "Science is universal and so can be its benefits. Its material benefits are immense and far-reaching industrialization of agriculture and release of nuclear energy, to mention two examples-but even more profound is its contribution to culture".

In simple words, science is the investigation and interpretation of natural phenomena which [illegible] our daily life. Thus Science is simultaneously a body of knowledge and continuous, self evaluative process of enquiry.

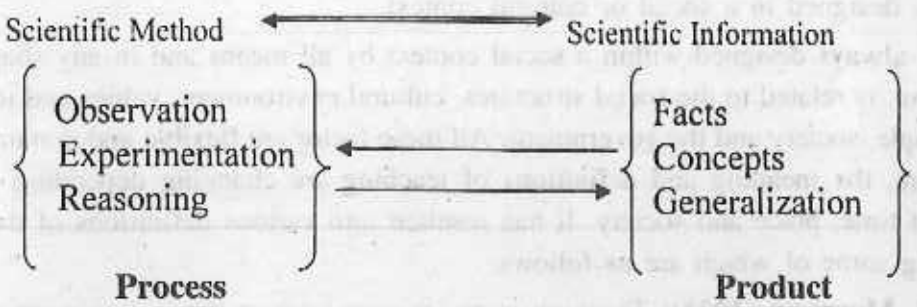
Science thus has two important approaches.

(a) Science as a Product.

(b) Science as a Process.

Various laws, theories, principles etc., are included in the category of science as a process. Though both aspects are important in their own way but to attain the aims of science education in schools more emphasis will be places on process approach.

The process of searching scientific knowledge can be explained as follows:



It is indicated that products (concepts, facts etc.,) are derived from process (observation and experimentation) and that these products lead to further process. So it is said that science is a continuous search for new knowledge through continuous inquiry. From the above relationships by saying that 'Science is both a body of knowledge (Product) and method of inquiry (Process)'. It is one of the specialized characteristics of science.

a) Concept of Teaching

Concept regarding anything is nothing but the general notion, popular opinion and the image that we form about any object; people or idea .It is the result of our direct and indirect experiences which we gain about object, people or ideas. The same is true for the concept of teaching. By the term 'concept of teaching' we know or ought to know about teaching in terms of its meaning, nature, and characteristics and all those which can distinguish it from the other similar concepts and activities. Hence, if we intend to know thoroughly about the concept of teaching , we have to look it from the various angles as follows :

- Understanding its meaning and defining it
- Knowing about the nature and characteristics of teaching
- Comparing teaching with other similar concepts
- Knowing about the relationship between teaching and learning
- Discussing about the analytical concept of teaching.

Teaching is nothing but an occupation or profession of a group known as teachers or an activity of a activities of a group under taken to help an individual to learn or

acquire some knowledge, skills, attitudes or interests. However, the meaning and concept of teaching is not so simple. It is a very complex social, cultural and ethical process designed in a social or cultural context.

It is always designed within a social context by all means and in any shape and therefore, is related to the social structures, cultural environment, values and ideas of the people, society and the government. All these factor are flexible and dynamic and therefore, the meaning and definitions of teaching are changing depending on the need of time, place and society. It has resulted into various definitions of the term teaching some of which are as follows:

H.C. Morrison (1934): Teaching is an intimate contact between a more mature personality and a less mature one which is designed to further the education of the latter.

John Brubacher (1939): Teaching is an arrangement and manipulation of a situation in which there are gaps and obstruction which an individual will seek to overcome and from which he will learn in the course of doing so.

B.O. Smith (1960): Teaching is a system of actions intended to product learning.

N.I. Gage (1962): Teaching is a form of interpersonal influence aimed at changing the behaviour potential of another person.

B.O. Smith (1963): Teaching is a system of actions involving an agent, an end in view, and a situation including two sets of factors – those which the agent has no control (class size, size of classroom, physical characteristics of pupils etc.) and those that he can modify (way of asking questions about instruction and ways of structuring information or ideas gleaned.)

Edmund Amidon (1967) : Teaching is defined as an interactive process , primarily involving classroom talk which takes place between teachers and pupils and occurs during certain definable activities .

Clarke (1970) : Teaching refers to activities that are designed and performed to produce change in student (pupil) behaviour .

Thomas F. Green (1971): Teaching is the task of a teacher which is performed for the development of a child. (Khan, 2011)

b) Concept of Learning

Life is a journey of learning starting from childhood to every stage of aging. Teaching & learning is interrelated to each other in a process where learning plays a key &

significant role to the learner & teacher both. Let us discuss here briefly about what is learning, what is its nature & characteristics as well as the relationship between teaching & learning through which concept of learning will be understandable.

Meaning and Definitions of the Term Learning

The term learning is very common & most natural in everyone's life in every different situations & times whether it is necessary or not. So in this perspective the way of learning, involvement & engagement in the process are also very important aspects. In this reference here is an example - to a child for the first time has no idea about the burning from fire, when he/she touches fire of a burning matchstick could feel the heat/ temparature & to some extent burns & gets to know what is fire through a process of learning. So from this situation the child is able to acquire the idea of self protection & keeps self away from the effect of fire for the future. From this process a child could get to gather experience of adverse effect, danger or self harm from the different type of incidents which is defined as learning. The behavioural changes of individual come through different way with the help of different experiences directly or indirectly. Some well – known definitions of the term learning are as follows:

Gardner Murphy (1968: 205): "The term learning covers every modification in behaviour to meet environmental requirements."

Henry P. Smith (1962: 260): "Learning is the acquisition of new behaviour or the strengthening or weakening of old behaviour as the result of experience."

Woodworth (1945: 288): "Any activity can be called learning so far as it develops the individual (in any respect – good or bad) and makes him alter behaviour and experiences different from what that would otherwise have been."

Kingsley and Garry (1957: 12): "Learning is the process by which behaviour (in the broader sense) is organized or changed through practice or training."

Pressey , Robinson and Horrocks (1967 : 232) : "Learning is an episode in which a motivated individual attempts to adapt his behaviour so as to succeed in a situation which he perceives as requiring action to attain a goal."

Crow and Crow (1973: 225): "Learning is the acquisition of habits, knowledge and attitudes. It involves new ways of doing things and it operates on an individual's attempts to overcome obstacles or to adjust to new situation. It represents progressive changes in behaviour. It enables him to satisfy interests to attain a goal."

Hilgard (1958 : 3): "Learning is the process by which an activity originates or is

changed through reacting to an encountered situation, provided that the characteristics of the changes in activity cannot be explained on the basis of native response, tendencies, maturation or temporary states of the organization (e.g. fatigue or drugs, etc.)."

The definition stated above may now help us to devise the following conclusion about the meaning and characteristic of learning:

1. Learning is a process and not the product.

2. It involves all those experiences and trainings of an individual (right from his birth) which help him produce change in his behavior.

3. Learning leads to changes in the behaviour but it does not necessarily mean that these changes always bring improvement or development in the positive direction. One has equal chances to be drifted to the debit side of human personality.

4. Learning prepares an individual for the necessary adjustment and adaption.

5. All learning is purposeful and goal- oriented. In case there is no purpose, there would hardly be any learning.

6. The scope of learning is too wide to explain in words. It is a very comprehensive process which covers nearly all the domains – conative, cognitive and affective - of human behaviour .

7. Learning is universal and continuous. Every creature that lives learns. In human beings, it is not limited to any age, sex, race or culture. It is a continuous never – ending process that goes from womb to tomb.

8. Learning does not include the changes in behaviour on account of maturation, fatigue, illness or drugs. (Khan, 2011)

c) Relationship between Teaching and Learning

With the context of relationship between teacher & learner it needs to be mentioned that these two terms "teacher" & "learner" are as much as relative to each other also it is not essential for teaching to be ended with some kind of learning. Similarly, learning may also take place without involving the formalities of teaching process. There are different type of institutions to raise up a child & they grown up through different technique, different environment & different type of guidance. So learning role is constant variable though teaching role varies from place to place & time to time. There are so many way of learning to upgrade or educate oneself that it depends on learner how & where they are interested to be involved & engaged. But it can be

said still all times golden words -if there is a good teacher there will be a good student & vise versa. They are successful when both of them are able to reach to the same goal & meet in the same point by the process of teaching & by the process learning.

Teacher teaches in the class to produce better qualities, implements better techniques, changes in ideas & thinkings to each individual in the same process. But it is quite natural that the learning outcome could be different, even though same opportunities & situations are provided by the teacher. The learning achievement varies from learner to learner depending on their abilities & backgrounds.

5.6 Planning the Lesson: Herbartian Approach; ICON Design and 5E approach

Introduction

In each and every sphere of life systematic, disciplined and organized planning always very essentials to do any task successfully in our life. Proper planning of any work helps us to utilize our time and energy on the part of human and material resources. Same way it is equally needed for the process of teaching and learning. A teacher has to warm up herself for teaching effectively and efficiently. An organized work always gives good result as he/she is fully prepared to be taught in the class. To educate herself teacher had to plan for the full academic session. This is further classified into different categories. For the benefit of teacher and student it can be planned in different scheme, such as-1) yearly planning, 2) unit planning and 3) daily lesson planning. There are many requirements mandated by the school system regarding the plan.

Lesson Planning In Teaching Learning Process:

Teaching has been repeatedly emphasized that good and effective teaching stimulates the learners to think and motivate them learn further. Teaching needs a technique. Teacher has to create learning situation so that the child feels the inner urge to know, to think and to do. Intelligent planning is key of success for the learners. Teacher is already ready with blueprint which helps us in the efficient, economical and smooth conduct of teaching learning activity. Teacher should go through and through of the topic and make huge other questions connected with the topic and make the class interesting for the learners to learn properly.

Origin of Lesson Plan:

A great psychologists Gestalt is known as the origin of lesson plan. His theory of learning has a great influence on human learning. As per him the learner perceives a thing or a problem or a situation in totality or as a whole. In learning of student a unit esxecute a vital role in understanding the whole concept. Thus, the whole is perceived part by part. Meaningful activities are related to one another within a unit. These activities provide, purposeful learning experiences and the learner understands the whole concept. There are two approaches of teaching plan. The first approach is propounded by Herbart. He stresses on the content and information's in a plan. The second approach is given by John Dewey and Kilpatrick. They have emphasized on the experiences of learner rather than information.

Need and Importance of Lesson Plan:

In the process of teaching lesson planning is foremost important. The need and importance of lesson planning has lots of values and advantages. It can be may precisely be mentioned in the following points:

1. To teach systematically it provide guideline to the teacher.
2. Teacher's aims and objectives more clearly helped him to delimit within his field of work.
3. It provides the teacher to achieve the objectives.
4. Instead of haphazard teaching it makes teaching-learning a systematic, orderly and economical process.
5. The sequences of contents is maintained.
6. By means of psychological basis the learners developed or encourage by linking the new knowledge with the previous knowledge of the pupils.
7. In course of teaching activities, it helps the learning structure.
8. In the presentation of the content use of appropriate teaching aids, suitable techniques, strategies, tactics is determined.
9. It also helps to control the students behavior, to identify suitable place during the teaching.
10. The classroom teaching activities are determined with the consideration of individual differences during the lesson planning.
11. It also helps to develop confidence and teaching activities satisfactorily between student and teacher.

12. A good lesson plans effectiveness depends on a teacher.

13. It also develops the power of reasoning, decision making and imagination between student and teacher

14. Specific teaching skills are developed by micro lesson

15. According to I. K. Davies, "Lessons must be prepared for here is nothing as fatal to a teacher's progress as unpreparedness".

5.6.1 Herbartian approach to lesson planning:

Herbartian approach is also known as Herbartian five steps approach. This approach is attempted in most of the teachers training institutions. This lesson planning is an ancient concept. During that time various attempts have been made to formulate a general procedure for the conduct of various types of lessons. Herbart is a first man to generate this famous procedure. John Fredrik Herbart (1776-1841 AD), a German philosopher and great educationist and his followers adopted and evolved the most famous procedure known as the 'Herbartain Formal Steps'. These are called formula steps, because these deal with the content of lesson. In the beginning Herbart introduced four steps. Later on another step added by his followers. According to the Herbartian School of Pedagogy, the five formal steps are as follows:

1. Preparation
2. Presentation
3. Association or comparison
4. Generalization
5. Application

Herbartian approach is theoretically based on apperceptive mass theory of learning. According to this theory, the child receives or learns the new knowledge easily if it is connected with the knowledge learnt previously by him. This approach is widely used in teaching of various school subjects. Outline of Herbartian Lesson Plan On the basis of five steps mentioned above an outline of a lesson plan has been developed to prepare lesson notes in practical form which include following points:

1. Subject, topic, class with section, period and date.
2. General aims of the subject teaching.
3. Specific objectives related to the topic or lesson.
4. Introduction

5. Statement of aim.

6. Presentation

7. Explanation

8. Black-board summary.

9. Recapitulatory questions or review questions.

10. Home work or assignment.

1. Subject, Topic, Class and Date-

In this step trainee teacher point out the date, period, class with its section, subject and topic to be taught at the top of his lesson note and concentrates on the content of a particulars topic.

2. General Objectives of Subject Teaching –

Each and every school subjects have their own general objectives. Student's standard of class, the general aims and objectives are varied according to the subject.

3. Specific Objectives –

During the 40-45 minutes period the teacher mentioned the specific objectives for fulfill the main aims of the topic. The specific objective may be knowledge, skill and appreciation.

4. Introduction –

Herbartian's five steps approach, introduction is preparation stage. It is beginning of teaching activities and student's mind should be prepared to receive new knowledge. The teacher asks some questions on the basis of their previous knowledge to connect the preparation is a sort of testing and rearranging the contents of previous lessons or correlating the lesson with the daily routine life. Arousing the interest of the students is a pre-requisite to the learning process that is way preparation is called 'Motivation' or 'Introduction'.

5. Statement of Aim –

The statement of aim should be clear cut, concise and free from unknown words. Introduction of the lesson should be effectively done. Then the aim will automatically emerged out.

6. Presentation –

Begning of the class introduction of the topic is very necessary. Later presentation should be done with the help of developing questions. Questions should be arranged according to the teaching procedure adopted.

7. Explanation -

Discussion of the previous questions and answer in simple form is done or presented if student are not able to answer this questions the teacher is supposed to explain the element or concept by giving explanation.

8. Black-board Summary —

In the beginning before starting the lesson some usual entries should be done such as date, period, and duration of the period, class, section and subject on the top of the black-board. Black board summary should include the main points of lesson, important terms, difficult words, formulas definitions explanations etc. In case of mathematics teaching blackboard is indispensable. As mathematics can be clarified only through writing because explanation not appropriate.

9. Recapitulation or Application –

In this step questions are asked by the teacher for practice. . It helps the teacher to know how far he has succeeded in the attainment of objectives. Going through this step student's knowledge and progress is developed or not is understood.

10. Home Work or Assignment—

At last home work is given to the student on the same topic . As practice is very necessary, so according to Herbartian lesson plan practice is must. And above mentioned steps should be followed.

5.6.2 ICON design

In education, the Interpretation Construction (ICON) Design Model is said ICON. It is one of the design models of constructive learning theory. In constructivist theory learners are directly involved in learning process. Learning, in the constructivist frame, is a process of meaning construction and interpretation, and certainly, social interactions from teachers and peers also influence learners' knowledge construction. Teachers are not the course material presenters or controllers; rather, they become the facilitators of students' knowledge construction. The ICON model emphasizes learners' interpretations of information and their processes of knowledge construction. Science learning, clearly, involves a series of information or observation interpretations and knowledge construction.

This model prescribed instruction based on observations and **constructing** information. **Interpretations** (understandings) based on observations and background contextual information. In this model, the *Role of the teacher* is creating a Study Support Environment (SSE).

Concept of ICON design

In learning process constructivist epistemology in viewing students many cognitive psychologist share that (Brooks and Brooks, 1993; von Glasersfeld, 1989) meaningful learning neither stems from direct motivation nor from environmental pressure (i.e., external stimulus). Hence prior knowledge plays an essential role in the learning process here events are engaged in construction and interpretation of individual experience. It also constructs and influence social interaction, knowledge and construction.

Instructional design or instructional science is concerned knowledge about optional 'blue-print'. In the field of instructional design there are two main theoretical approaches, such as the systematic approach and constructivist approach. Systematic approach is viewed as a process, consisting input and output process.

Epistemology and psychological aspect of constructivist learning views instructional design in order to facilitate students learning through creation. Main emphasize is on the principles of learning related with authentic context, which includes learning in social experience and the experience of knowledge constructions.

Different criteria are based on learning and teaching approaches. As present teaching and learning approaches are considered based on 'individual' or 'group'. According to constructivist design model is oriented towards one person or student is called individual and several people learning in a small or large group of students is called group based

In regard to learning and teaching process if model contents the capacity for designing both individual and group then it can be named with dual purpose.

Ther are many teaching learning models based on this approach. Some of them are listed below:

1. Participatory Design Model
2. Anchored Instruction
3. Cognitive apprenticeship
4. Generative learning
5. Computer Supported Intentional Learning Environment (CSILE)
6. Discovery Learning
7. Interpretation Construction Design Model (ICON)
8. Mind Tools
9. Problem-Based Learning

10. Project Method

Here in this sub unit we will discuss in detail the ICON Design Model as a potent pedagogical approach.

Principles of the ICON model

Teaching and learning approach of ICON model emphasizes on student's encounter with authentic issues in groups on constructing interpretation or searching for information in group and facing different interpretation about the problem in groups; individual learning process is a evidence and therefore dual purpose learning is acceptable model.

Relevant principles by the ICON model

a) Observations in authentic activities; interpretation construction; contextualizing prior knowledge

b) Cognitive conflict; interpretation construction

c) Interpretation construction; contextualizing prior knowledge

d) Cognitive apprenticeship; collaboration; interpretation construction

e) Multiple interpretations; multiple manifestations; interpretation construction

f) Interpretation construction; multiple interpretations

Characteristics of ICON model

i. Instructions are based on observation and constructing information

ii. It is a group-based teaching learning approach

iii. It rest on constructive design principles

iv. It views teacher as a creator of Study support Environment

v. This model fosters the construction of interpretations based on observations and background contextual information

Steps of the ICON model

1. Observations in authentic activities
2. Interpretation construction
3. Contextualizing prior knowledge
4. Cognitive conflict
5. Cognitive apprenticeship

6. Collaboration
7. Multiple interpretations
8. Multiple manifestations

1. Observations in authentic activities-

Number of researches has been done in this matter. Observation in authentic activities is very important as if they only memorize students cannot do the work appropriately There is problem in science educators should do some authentic observation so that they could construct their own frames.

2. Interpretation construction-

Learners cannot simply reproduce transmitted knowledge but have to construct it by themselves. Teachers have to create learning environments where students have opportunities to construct their interpretation of new information. A proper understanding of creative nature of scientific knowledge can help students actively engage in the interpretation construction process.

3. Contextualizing prior knowledge

The contextualization intends that students access background and contextual materials of various sorts to aid interpretation and argumentation. So, the students should use their own relevant prior knowledge to interpret some phenomena in a certain context.

4. Cognitive conflict

It is recognized that the demonstration of discrepant events is only one of the many steps for students to process conceptual change.

5. Cognitive apprenticeship

Constructivist teacher are very different from so called traditional teacher, who are simply information providers. Teachers should give proper situated guidance when facing students various interpretation. On the other hand they emphasize the importance of the cognitive apprenticeship guided by teachers.

6. Collaboration

Collaborative group learning can promote students achievement, motivation and attitudes towards learning. Educators should encourage students to be collaborative in observation, interpretation and contextualization.

7. Multiple interpretations

Students can collectively construct various interpretations for a natural phenomenon, and they can together evaluate these views and further decide which one is most useful and meaningful in explaining this phenomenon in the particular context.

8. Multiple manifestations

Educators also suggest that when learning a new scientific conception, showing its fruitfulness is a necessary condition for student's conceptual change. Students acquire transferability by seeing multiple manifestations of the same idea at different times and in various contexts.

Example of ICON model

To illustrate the application of this design framework, it is described SSE programs. SSE means Study Support Environments. The key consideration in designing a SSE is fostering the construction of interpretations based on observations and background contextual information.

Teachers College, Columbia University has been collaborating with the Dalton School (a K-12 independent school in New York City) on the Dalton Technology Plan. The general aim of this plan is to develop a digital knowledge-base and information infrastructure for all aspects of the K-12 educational experience, and to implement educational strategies designed to make use of this infrastructure, enhancing significantly an already excellent educational experience.

Specifically, it is describe how these constructive design principles apply to the *Archaeotype* program used in class 6th grade history, to the *Galileo* programme used in 11th and 12th grade science(particularly for students not scientifically oriented), and the *Playbill* programme used in 10th grade English at the Dalton School. Archaeotype is a computerized archaeological simulation. Developed as a network-based multimedia alternative to the textbook bound class curriculum in the Ancient World, Archaeotype provides students with a collaborative and interdisciplinary environment in which to uncover and interpret the past by presenting primary sources, both textual and artifactual, as evidence for the students' construction of history.

In the *Archaeotype* program, students study ancient Greek and Roman history by using observations of simulated archaeological digs to construct interpretations of the history of these sites, while drawing upon a wide variety of background information. The *Archaeotype* program prepared a programme (implemented in supercard on Apple Macintosh computers)and presents the students with a graphic simulation of an archaeological site, then the students study the history of the site through simulated digging up of artifacts, making various measurements of the artifacts in a simulated laboratory (**Observation**), and relating the objects to what is already known using a wide variety of reference materials (**Contextualization**). The students work cooperatively in groups (**Collaboration**), while the teacher models how to deal with

such a site then fades her involvement while coaching and supporting the students in their own study efforts (**Cognitive Apprenticeship**). The students develop ownership of their work by developing their own interpretations of the history of the site and mustering various kinds of evidence for their conclusions (**Interpretation Construction**). By arguing with the other students and studying related interpretations in the historical literature, they get a sense of other perspectives (**Multiple Interpretations**). By going through the process a number of times bringing each contextual background to bear on a number of different artifacts, the students learn and understand the many ways that the general principles behind what they are doing become manifest (**Multiple Manifestations**).

This approach can be applied to Study Support Environment programs in widely different fields of study — namely, history, science and literature. In addition to learning specific content, students using these programs acquire generalizable interpretation and argumentation skills. Thus, constructivist design framework is useful both for guiding design and for producing valuable learning results.

5.6.3 5E Method

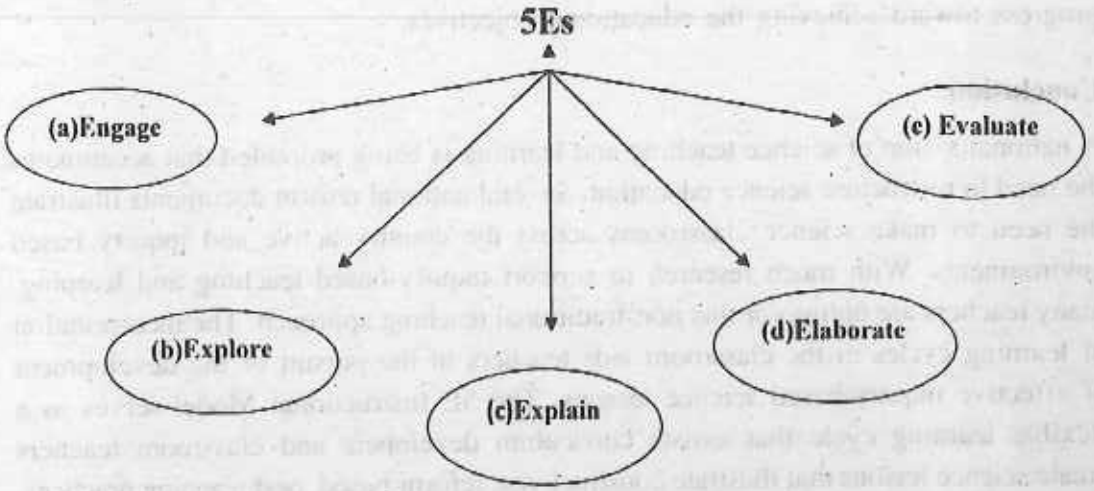
The 5E is describe the phase of learning for all age groups. It is a instructional model based on constructivist approach in learning. Constructivist approach is based on the believe that learners are actively involved in a process. Each of the 5Es such as Engage, Explore, Explain, Elaborate, and Evaluate.

Research made by John Dewey and Jean Piaget influenced in development of informal education and childhood development. Dewey's idea of influential education suggests that education must engage with and enlarge experience and the exploration of thinking and reflection associated with the role of educators. Piaget's role in the constructivist teaching suggests that we learn by expanding our knowledge by experiences which are generated through play from infancy to adulthood which are necessary for learning. Their theories are now encompassed in the broader movement of progressive education. Therefore, children learn best when they are allowed to construct a personal understanding based on experiencing things and reflecting on those experiences.

One of the primary goals of using constructivist teaching is that students learn how to learn by giving them the training to take initiative for their own learning experiences.

The instructional model is based on constructivist learning theory. This theory suggests that students learn best when they are allowed to work out explanations for

themselves over time through a variety of learning experiences structured by the teacher. Students use their prior knowledge to make sense of these experiences and then make connections between new information and their prior knowledge. To help them make the connections between what they already know and new information, teachers will organise each Primary Connections unit into five phases – Engage, Explore, Explain, Elaborate and Evaluate.



(a) Engagement

Through the use of short activities that promote curiosity and helps them to engaged in a new concept. This task creates connections between past and present learning experiences expose prior connection and organize student thinking current activities.

(b) Exploration

Conceptual change is facilitated and identified if students are provided to explore their common experiences. To generate new ideas, explore questions and possibilities that help them to use prior knowledge.

(c) Explanation

This phase focuses student's attention on a particular aspect and explore experiences provide opportunities to demonstrate their conceptual understanding, process, skill or behaviour. And explanation from the teacher may guide them towards a deeper understanding.

(d) Elaboration

In this step students apply their understanding of the concept by conducting additional activities. Students through new experiences develop deeper and broader understanding more information and adequate skill.

(e) Evaluation

In this phase teachers get opportunities to assess their ability and to evaluate student's progress toward achieving the educational objectives.

Conclusion

A national vision of science teaching and learning is being promoted that accentuates the need to restructure science education. Several national reform documents illustrate the need to make science classrooms across the country active and inquiry based environments. With much research to support inquiry-based teaching and learning, many teachers are opting for this non-traditional teaching approach. The incorporation of learning cycles in the classroom aids teachers in the pursuit of the development of effective inquiry-based science lessons. The 5E Instructional Model serves as a flexible learning cycle that assists curriculum developers and classroom teachers create science lessons that illustrate constructivist, reform-based, best teaching practices.

5.7 Let Us Sum Up

Pedagogy is a term used in educational writing but its meaning is assumed to be self evident. Pedagogy deals with the theory and practice of teaching and it effects on the learning of students. Concept of teaching means all those which we know about teaching in terms of its meaning. Teaching is nothing but either an occupation or profession of a group known as teacher. Also it is an activity of activities of a group undertaken to help an individual to learn or acquire some knowledge, skills, attitudes or interests. The meaning and definition of teaching always change depending on the need of time, place and society.For any activity or work, instruction is a must, and for education, it plays the vital role. The term *instruction* is often used to describe the most rudimentary programming commands. The difference between Education and Instruction is that, Education is the result of going to school and learning values and acquiring culture where as Instruction is when you teach someone how to do a particular thing. For example, teaching medicine, carpentry or management. When ideas, doctrines, attitudes and cognitive approaches are forcibly applies then the

process is called Indoctrination. **Conditioning**, in physiology, is a behavioural process whereby a response becomes more frequent or more predictable in a given environment as a result of reinforcement. Conditioning is a form of learning. In this process, in which-(1) a given stimulus (or signal) becomes increasingly effective in evoking a response or (2) a response occurs with increasing regularity in a well-specified and stable environment. Andragogy is a methods and principles used for adult education. The word comes from the Greek *andr-*, meaning "man", and *agogos*, meaning "leader of"; which means "leading man" and "pedagogy" means "leading children". Critical Pedagogy (CP) is an approach to language teaching and learning. Critical Pedagogy comes from critical theory, which is concerned with the idea of a Society in which people have political, economic, and cultural control of their lives. "Thinkers of critical theory believe that these goals are satisfied only through emancipating oppressed people which empowers them and enables them to transform their life conditions. The most celebrated critical educator Paulo Reglus Neves Freire influenced critical pedagogy very much. Freire was a Brazilian educator and philosopher who was a leading advocate of critical pedagogy. He is best known for his influential work, *Pedagogy of the Oppressed*, which is considered one of the foundational texts of the critical pedagogy movement.

Science has been derived from the Latin word "Scientia" which means knowledge. It is a systematizeds body of knowledge which may pertain to any subject. Scientific teaching is a pedagogical approach used in undergraduate science classrooms whereby teaching and learning is taught with the same rigor as science itself. Concept regarding anything is nothing but the general notion, popular opinion and the image that we form about any object ,people or idea. It is the result of our direct and indirect experiences which we gain about object, people or ideas. The same is true for the concept of teaching. Life is a journey of learning starting from childhood to every stage of aging. Teaching & learning is interrelated to each other in a process where learning plays a key & significant role to the learner & teacher both. With the context of relationship between teacher & learner it needs to be mentioned that these two terms "teacher" & "learner" are as much as relative to each other also it is not essential for teaching to be ended with some kind of learning. In each and every sphere of life systematic, disciplined and organized planning always very essentials to do any task successfully in our life. An organized work always gives good result as he/she is fully prepared to be taught in the class. Teacher should go through and through of the topic and make huge other questions connected with the topic and make the class interesting for the learners to learn properly. In the process of teaching

lesson planning is foremost important. The need and importance of lesson planning has lots of values and advantages. According to the Herbartian School of Pedagogy, the five formal steps are as 1. Preparation, 2. Presentation 3. Association or comparison,4. Generalization5. Application. In education, the Interpretation Construction (ICON) Design Model is said ICON. The Information Construction (ICON) model contains seven stages, such as Observation, Interpretation Construction, Contextualization, Cognitive Apprenticeship, Collaboration, Multiple Interpretations, Multiple Manifestations. The 5E is describe the phase of learning for all age groups. It is a instructional model based on constructivist approach in learning. Constructivist approach is based on the believe that learners are actively involved in a process. Each of the 5Es such as Engage, Explore, Explain, Elaborate, and Evaluate.

5.8 Unit End Exercise

Q. 1. What do you mean by Pedagogy?

Q. 2. Write the definition of term teaching.

Q. 3. Write a short note on 'Andragogy'?

Q. 4. Discuss briefly the concept of 'Critical Pedagogy'.

Q. 5. What do you mean by Banking Model of Education?

Q. 6. What is the relation between Teaching and Learning?

Q. 7. Write the importance of Lesson Plan.

Q. 8. Narrate vividly the Herbartian approach regarding Lesson Plan.

Q. 9. Write a short note on 'ICON'.

Q. 10. Discuss briefly the '5-E Approach'.

5.9 Bibliography

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Unit 6 ❑ Teaching

Structure

6.1 Introduction

Teaching is the process of attending the people's needs, experiences and feelings, and intervening so that the learner, can learn particular concept, and go beyond the given. Interventions commonly in the form of questioning, listening, giving information, explaining some phenomenon, demonstrating a skill or process, testing understanding and capacity, and facilitating learning activities (viz., note taking, discussion, assignment writing, simulations and practices).Teaching involves creating an environment and engaging with others, so that they learn particular things. This can be anything from tying a shoe lace to appreciating the structure of a three act play. Three key-elements may be highlighted here - focus, knowledge and the ability to engage people in learning.

Some of the teaching we conduct can be planned in advance because the people involved know that they will be attending a session, event or lesson where learning particular skills, topics or feelings is the focus. Some teaching arises as a response to a question, issue or situation. However, both are dependent on recognizing and cultivating teachable relationships for learning.

Teaching as a process is a gamut of attributes and function. Here in this unit, you will be exposed to various aspects of teaching.

6.2 Objectives

Upon completion of the unit, you will be able to:

Know the factors affecting teaching as a process ;

Acquaint with the maxims of teaching and the fundamental principles underlying the process ;

Delineate the observation of classroom behavior in the light of Flander's Interaction Analysis Category System ;

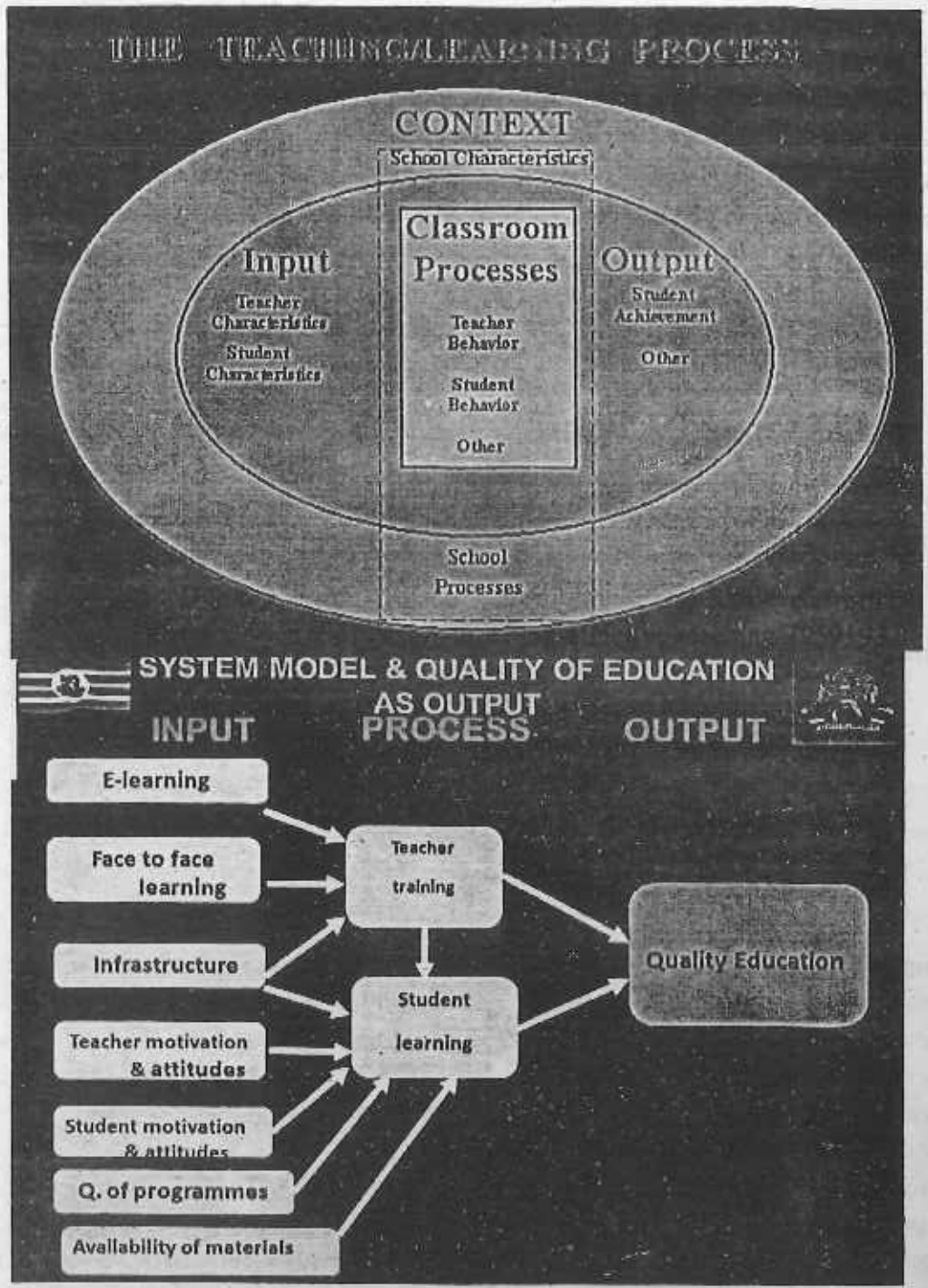
Understand microteaching as a modification of teacher behavior.

6.3 Factors affecting teaching: Input, Process and Output variables; General principles of teaching

Factors affecting effective teaching is a component because after analysis of all factors that affects teaching, a teacher can improve and can become a good teacher and create better citizen for the country because a teacher is a nation builder. There are many factors which affect teaching. These factors may be listed as:

- Teacher knowledge, passion and responsibility for learning ;
- Classroom activities that encourage learning environment ;
- Assessment activities that encourage learning through experience ;
- Effective feedback that establishes the learning processes in the classroom ;
- Effective interaction between the teacher and the students, creating an environment that respects, encourages and stimulates learning through experience.

Input, Process and Output variables: These three variables are identified as potent factors that affect teaching process. These variables act through system approach. System approach is a term that means to do something systematically. In educational process, to teach systematically teachers must consider input, process and output and decide objectives, contents, methods and assessment. The inputs are basically the objectives and objectified contents that teachers put in while the processes are the methods of delivery of contents. Outputs are the end-product of educational inputs and process those must be assessed based on objectives. Probably the most difficult struggle facing the educational industry is about how the curriculum to be customized. Curriculum is the result of piecing together of a number of information including vision and mission statements of educational institutions. Objectives, contents, methods



Source : Mangal, S. K. 2006, Essentials of Educational Technology

and assessment are the key elements of a curriculum. By proper implementation of the system approach the educational managers can be able to raise the standard of education and assure the quality and excellence in performance. The images below clearly depicts the elements of the input, process and output variables/factors involved in a teaching system. A model framework by Mcgrath (1984) of Iowa state University has been given below to show the interrelationship and interdependence among the variables/factors of teaching.

6.4 Maxims of Teaching: Fundamentals of teaching.

Maxims of Teaching :

Experience is said to be a good teacher and a trusted guide. Educationists and teachers engaged in the task of actual classroom teaching evolved certain simple notions and working ways based on their own experiences which may prove quite helpful in the task of teaching. These are known as maxims of teaching. They are quite trustworthy, time honored and universal Let us try to discuss some of the important ones.

(i) From Known to Unknown :

The unknown is usually feared whether the known is trustworthy. Hence, known can always prove a reliable base for making acquaintance with the unknown. A known friend or an individual may work as a source for acquaintance with other people. Similarly, previous knowledge of a particular subject or topic may help us to collect new information and explore the unknown. After acquiring knowledge and skills in solving the problems on addition and susbtraction, one can learn easily the essentials of multiplication and division. A wise teacher should always plan his teaching on the principle of proceeding from the known to the unknown. He she should first try to acquaint himself with the entry-level behavior, previous experience and all that is known by the pupil and then proceed on his her task of teaching new things or deriving some changed form of behavior from the pupil.

(ii) From definite to indefinite :

A good teaching should always lead from definite to indefinite. One can always trust the tested or definite, and therefore definite things, concepts, events or knowledge may easily be approached for catching the indefinite ones. Definiteness of the known facts in a multiplication table may help a student to acquire the knowledge or skills concerning thousands of odd combinations related to multiplication, division, square

or cube roots. Similarly, definite rules of the grammar may help a student learn the concerned language effectively.

(iii) From Simple to Complex :

It is always better to begin with relatively simpler things than to fight with the unnecessary difficult and complex ones. Proceeding from simple to complex or easy to difficult always provides an appropriate learning order or sequence. Such properly graded sequence may work as the schedule of automatic reinforcement as the grasp and understanding of simple ones not only motivates an individual to aspire more and little difficult but also equips him with the understanding and mastery of the difficult and complex concepts and phenomena in the course of learning.

(iv) From Concrete to Abstract :

Abstract is confusing, difficult to understand and subjective. One may be easily bored,fatigued, perplexed and lose one's patience while attending to an abstract phenomenon. It is difficult to be remembered and applied in practical situations. In contrast, concrete is relatively simple, understandable or objective. Acquisition of a new knowledge or skill may become a simpler task when it is supported with concrete examples, objects and events. A good teaching should lead from concrete to abstract. The concrete material is to be shown, living examples are to be given and the children should be given maximum opportunities for acquiring direct experiences in order to make them able to learn the abstract concepts and experiences at the later stage.

(v) From Actual to Representative :

Actual or real objects, a piece of knowledge, principle and theorem are always better than their replica or representative in any process of teaching and learning. An on-the-spot experience of the thrills and life of a mountain lake, lonely desert, whistling trees and chattering birds is unmatchable in terms of direct influence and educative value. Visit to an airport is going to have lasting impression and clarity in thoughts and concepts in comparison to mere talking about aeroplanes and aerodrome verbally or through illustrative aids.Therefore, a wise teacher should always lead his students from actual phenomenon to the artificial representation.

(vi) From Particular to General :

Generalized facts, principles, concepts and phenomena are quite abstract in nature and, therefore, should not be presented in the beginning of a teaching. A teacher who begins by saying that matter has weight and then presents particular examples or provides demonstrations related with particular solids, liquids or gases is placing

horse before the cart. One cannot generalize without facing or acquainting oneself with the particular instances leading to the generalization of the fact or behavior. Therefore, a teacher should always begin with the learning or experiencing of the particular cases, facts or instances and then persuade his students to generalize or conclude.

(vii) From Whole to Parts :

Whole is always not only greater than the parts but also more understandable, motivating and effective. Therefore, beginning should always be made the whole, and then step-by step its various parts or constituents should be presented before the students. For example, in teaching the topic "parts of the flower", the beginning should be made with the actual presentation of the whole flowering plant and then gradually the knowledge of the elements and functioning of the different parts should be presented. Similarly, a model of the water pump and the actual working of this pump should be demonstrated as a whole and then the study and working of its different parts should be taken step-by-step.

(viii) From Induction to Deduction :

Induction is a way of proving a thing or statement by arguing if it is true for a particular case, and then it should be true for the next similar case, and so on. While employing it in teaching, a teacher is required to place particular instances, examples facts or experiences before the students. On the basis of similarities of properties and repetition of a phenomenon, the students are thus made to generalize a concept, principle or rule. On the other hand, deduction is the net result of induction. Here the beginning is made by placing the generalized fact, principle, formula or rule before the students and then they are asked to verify the truth of the generalization by applying it in particular instances or examples. It is needless to say that all good teaching begins with induction and ends in deduction. Knowledge is formative and induction is a way of discovering the knowledge. Deduction is the result of such discoveries.Therefore, a teacher should always proceed from induction to deduction in his teaching.

(ix) From Analysis to Synthesis :

Analysis refers to a process of breaking or separating out a thing into the simpler parts, elements or constituents in order to understand its structure or composition. It is a sort of operation or investigation that is being carried out to know the hidden aspects of a problem, the causes of an event or behavior or understanding the complex nature of a thing or phenomenon. For example, to understand the structure and working of a machine the structure may be disassembled in terms of its various

components or parts and then one can gather knowledge for these components. To know the composition of a salt (compound or mixture) it may be analyzed into its elements and then knowledge about the composition or properties of various elements may be acquired. On the other hand, synthesis works quite opposite to analysis. It refers to a process of combining the different elements or parts of a thing in totality. In comparison to synthesis, the process of analysis represents a systematic and natural way of investigation and discovery. It is a formative approach quite applicable to the beginning of a learning or teaching act. Therefore, good teaching should always begin with analysis and lead to synthesis.

(x) From Empirical to Rational :

In a teaching - learning process, it is always safe to begin with rather than with what we agree, generalize or explain. The former approach is empirical while the latter is rational. Development of the rational point of view is a goal, a result of a process of empirical findings. The concrete facts or empirical evidences are the rock bottom of a conclusion or rational knowledge. The rational thinking is not the product of empty ideas or lofty ideals having no naked truth or concrete happenings. A teacher has to place facts, evidences, direct or indirect experiences, examples and instances full of objectivity and validity to arrive at some conclusion or develop a rational point of view in understanding the nature and concepts of the objects, people, events and phenomena.Therefore, in good teaching one should always lead the student from empirical to rational goals.

(xi) From Psychological to Logical :

The Psychological point of view emphasizes the importance of psychological principles of learning and teaching in the process of education. Here, the child is the center of education; his needs, interests, abilities and capacities are the deciding factors for the planning and organizing of the teaching activities. The instructional goals are made to serve the cause of the child. The curriculum, teaching strategies, aid material and teaching - learning environment, all are set in view of the psychology of the child and teaching - learning. But it should not mean that a teacher has to go unplanned or move haphazardly in his teaching act. What is to be taught, although based on psychological footing, should have some logic. The proper organization and sequencing of teaching activities in terms of the organization of learning experiences, teaching strategies, evaluation activities and feedback devices are very much essential for the effectiveness of a teaching activity Therefore, a wise teacher cares for a beautiful integration of psychological principle to logical agreement in his teaching. He is to move on a psychological track keeping in view the logic behind his sequences of activities.

6.5 Observation of classroom behavior: Flander's Interaction Analysis Category System and its Interpretation

Flanders' interaction analysis categories :

In total, there are ten categories of verbal behavior in this system which are grouped into three major sections (Mangal & Mangal 2009) : (i) Teacher talk, (ii) Student talk, and (iii) Silence or Confusion.

Teacher Talk consists of seven categories. The first four categories belong to indirect influence and the latter three to direct influence. The category of indirect influence covers those verbal behaviours of the teacher which give the students greater opportunity to respond or maximize their freedom of action. In contrary, the category of direct influence exhibits those verbal behaviours of the teacher which tend to restrict or minimize the students' freedom of action.

Student Talk divided into two categories. The third section, Silence / Confusion, includes all those behavious that are not covered in the first and second sections. These sections and their ten categories with underlying component behaviours are summarized in the Table below.

Table : Flanders interaction analysis categories.

a) Teacher Talk	
Indirect Influence	1. Accepts feeling.
	2. Praises or encourages.
	3. Accepts or uses pupil ideas.
	4. Asks questions.
Direct Influence	5. Lecturing.
	6. Giving directions.
	7. Criticizing or justifying authority.
b) Student Talk	
Response	8. Pupil talk response.
Initiation	9. Pupil talk initiation.
c) Silence / Confusion	10. Silence or confusion.

How to use Flanders' interaction analysis :

This system involves the following three major steps:

1. Observation or recording or classroom events.
2. Construction of interaction matrix.

3. Interpretation of interaction matrix.

Let us discuss these aspects in details:

Observation or recording of classroom group. 'The observer is required to select appropriate position in the classroom to listen and watch the events as smoothly as possible without disturbing or interfering with the spontaneous activities. He she is also required to train himself for the proper recording (referred to as encoding in the language of interaction analysis). For this purpose, he she must memorize the code numbers (the category number) in relation to the component behaviours represented by the different categories. The next is to note down within every three seconds the code or category number which best represents the interaction event just observed. For instance, when the teacher is praising, he should put 2; when he is lecturing he should write 5; when he is asking questions, he should write 4; and again if he praise, he should write 2 on his datasheet. The procedure of recording or encoding of the classroom events may go on at the rate of 20 to 25 observations per minute. Here, the observer, in a sense, acts as an automatic device, highly discriminating and objective in observing each and every aspect of the classroom events and recording it in terms of the code of or category number. These numbers are recorded in a sequence in a column.Therefore, at the end of his observation, he may get a long series of numbers written from top to bottom so that the original sequence of events is preserved. Besides, he may write down marginal notes for explaining the unusual class events.

Certain ground rules:The task of observation, recording, or encoding is quite complex and needs sufficient training, practice and care on the part of the observer. For maintaining objectivity and reliability of the process there are certain ground rules which have to be kept in mind:

Rule 1: When not certain to which two or more categories a statement belongs, choose the category that is numerically farthest from category 5; e.g. for choosing between 3 and 4, choose 3, and for 8 and 9, choose 9.

Rule 2: If the primary tone of teacher's behavior has been consistently direct or indirect, do not shift to the opposite classification unless a clear indication of the shift is given.

Rule 3: The observer must not be concerned with his own biases or teacher's intent.

Rule 4: If more than one categories occur during the three seconds interval, all categories used in that interval are recorded;therefore, record each change in category. If no change occurs within three seconds, repeat that category number.

Rule 5: For silence longer than three seconds, record 10 for every three seconds.

Rule 6: A teacher's joke which is made at the expense of children is recorded as.

Rule 7: It is recorded as 8 if a student gives a specific predictable answer to a narrow question, or a number of students respond collectively.

Construction of interaction matrix: After recording or encoding the classroom events into ten categories, the next task is concerned with the constructing of an interaction or observation matrix table. The matrix table consists of 10 rows and 10 columns. The category numbers of the record sheet are tabulated in the table. Each number is entered in the form of sequence pairs, being used twice, firstly as the first number and secondly as second number. Its rows represent the first number in the pair and the column, the second. Each pair of numbers overlaps with the previous pair and such overlapping pairs of observation are entered in appropriate cells of the matrix.

In the matrix construction, one is to make sure that the entire series begins and ends with the same number. It is customary to add a 10 to the beginning and end of the series if it is not already present. Let us illustrate the process of matrix construction with an example .

Suppose an observer has recorded or encoded the category numbers as 5, 4, 3, 10, 6, 2 ,6,1,8 and 2 . Let us add 10 in the beginning and 10 at the end of this series and try to form pairs . The result may be presented as :

Original Series	***Series for pairing***	***Pairing***	
5	10		10 I Pair
4	5	II Pair	5
3	4		4 II Pair
10	3	IV Pair	3
6	10		10 V Pair
2	6	VI Pair	6
6	2		2 VII Pair
1	6	VIII Pair	6
8	1		1 IX Pair
2	8	X Pair	8
	2		2 XI Pair
	10		10

The pairs may be now entered in the matrix as given in Table given below:

Explanation about entries in the matrix table : The first sequence pair (10,5) has been tallied in the cell located at the intersection of 10^{th} row and 5^{th} column . The next pair (5, 4) is being tallied in the cell located at the intersection of the 5^{th} row and the 4^{th} column. Similarly all the remaining pairs have been tallied in their respective cells as shown in the above Table.

For exercising a check in the constructions of the matrix, the total number of observations N will always be tabulated by N - 1 tallies in the matrix . In the present example, these are

Category	1	2	3	4	5	6	7	8	9	10	Total
1								/			1
2										/	2
3										/	1
4			/								1
5				/							1
6	/	/									2
7											0
8		/									1
9											0
10					/	/					2
Total	1	2	1	1	1	2	0	1	0	2	11

12 category numbers (including the extra 10), which have produced a total of 11 tallies in the matrix.

Interpretation : The process of interpretation of interaction or observation data is often called as decoding. It may help in knowing what was going on inside the classroom in terms of teacher behavior and classroom interaction for communication. It has two broad aspects : (i) quantitative, and (ii) qualitative.

Quantitative analysis of teacher behavior : It may be based on the following aspects :

1. Interaction categories
2. Areas of interaction
3. Behaviour ratios
4. Interaction variables

Let us discuss them one by one.

Interaction categories : It represents the simplest way of interpreting the interaction data.

Here the total of the column representing the use of various categories are taken for the interpretation. These are converted in percentages, which help in ascertaining the relative importance given to the use of various categories by a teacher.

Advantages and limitations of Flanders' Interaction Analysis System :

Advantages:

1. It is a reliable and objective technique of observing and analyzing the verbal behavior of a teacher and classroom interaction.
2. It may help in determining the pattern and flow of teaching behavior.
3. It helps in understanding analytically what in fact goes on in the classroom.
4. Through the use of this system, student - teachers may practice and learn many new desirable teaching behaviors quite unknown to traditional teaching.
5. Being a potential tool of the feedback, it helps in acquiring the desirable patterns of teaching and modifying one's teaching behavior.
6. It adds and supplements the training techniques such as micro-teaching and team teaching.
7. It can be used for carrying out research in the areas of teaching, teacher - behavior, and pre-service and inservice education of teachers.

Limitations: The Flanders' System of Interaction Analysis suffers from the following drawbacks and limitations :

1. The system concentrates on verbal behavior and does not describe the classroom interaction or teacher behavior in its totality. Some behaviors are always overlooked, which might be important too.
2. The system, being content free, does not incorporate various essential steps of teaching a particular subject and, therefore concerned behaviors have to be arbitrary categorized by the observer.
3. It focuses a great deal of attention on direct / indirect teacher influence and teacher talk. These are provided, respectively, three and four categories.
4. Classroom interaction in the form of pupil - pupil interaction does not find place in this system.

5. The process of tallying, constructing matrix and interpreting matrix prove uneconomical in terms of time, labour and money .

6. Its use requires highly trained, reliable and competent observer / interpreter which are always in acute shortage.

7. It does not provide value judgments about good and bad teaching behaviors,

8. Certain activities such as demonstrating an experiment in Science, model reading in language, map and chart reading in Social Studies do not find appropriate classification in this system.

9. Only one category has been providing to silence and confusion. Equating of silence with contusion is not appropriate. Moreover, in this system no attempt has been made to classify silence as purposive and non-purposive which is serious drawback.

10. In this system, fourth category related with asking questions does not classify this types of questions asked. Therefore, it becomes very difficult to interpret or analyze the teacher behavior in its true form on the basis of the observations of this category.

In this way, the Flanders' System of Interaction Analysis suffers from some serious drawbacks and limitations. For doing away with these difficulties, many attempts have been made to suggest suitable modification in this system. We would like to throw light on some of these attempts in the following pages.

6.6 Micro-Teaching

Micro-teaching is a significant effort to make teacher education / training programme more effective and meaningful than the traditional programme by making it more scientific. Micro - teaching is one of the important innovations in this direction. It is a controlled practice that makes it possible to concentrate on various aspects of teaching behaviour in the student-teacher training programme. Micro - teaching is a training programme that aims at simplifying the complexities of the teaching process.

Following definitions of micro - teaching throw a lot of light on the meaning and significance of micro - teaching. (https://en.wikipedia.org/wiki/microteaching)

Alien, D.W. (1966). Micro -teaching is a scaled down teaching encounter in class size and class time.

Clift, J.C. and Others (1976). Micro - teaching is a teacher training programme which reduces the teaching situation to a simpler and more controlled encounter achieved by limiting the practice teaching to a specific skill and reducing time and class size.

Jangira, N.K. and Singh,Ajit (1982). Micro - teaching is a scaled down teaching encounter or miniature classroom teaching.

Singh, I.C. *(1977),* Micro - teaching is a scaled down teaching encounter in which a teacher teaches a small unit to a group of five pupils for a short period of 5 to 20 minutes. Such a situation offers a helpful setting for an experienced or inexperienced teacher to acquire new teaching skills and to refine old ones. *Objectives of Micro - Teaching.*

1. To enable the teacher - trainees to learn and assimilate new teaching skills under controlled conditions.

2. To enable the teacher - trainees to gain confidence in teaching by mastering a number of teaching skills on a small group of students.

3. To make use of the academic potential of teacher - trainees for providing much needed feedback.

4. To derive maximum advantage with the available material, money and time.

Main Propositions of Micro Teaching: Alien and Ryan in their book on the subject give the following main proposition of micro-teaching:

- Micro - teaching is real teaching although a teaching situation is constructed in which the student - teacher and pupils work together in a practice situation.Bonafide teaching does take place.
- Micro - teaching lessens the complexities of normal classroom teaching. Class size, scope of content and time are all reduced.
- Micro - teaching focuses on training for the accomplishment of specific tasks. These tasks may be the practice of instructional skills, the practice of techniques of teaching, the mastery of certain curricular materials, or the demonstration of teaching methods.
- Micro - teaching allows for the increased control of practice. In a micro - teaching setting, the time, number of pupils, methods of feedback and supervision, etc. may be manipulated.
- Micro - teaching greatly expands the normal knowledge of results or feedback dimensions in teaching. Immediately after teaching a brief micro - lesson, the trainee is engaged in a critique of his performance. All this feedback can be immediately translated into is practice when the trainee re-teaches shortly after the critique conference.

STEPS IN MICRO PLANNING

The three phases involve certain steps which are given as under:

1. Orientation of the student - teachers to the micro - teaching programme,

2. Discussing teaching skills.

3. Selection of a particular skill.

4. Presenting of a model demonstration lesson on a particular skill.

5. Observation of the model skill by student - teachers and recording their observations on the observation schedule.

6. Critical appreciation of the model lesson by student teachers.

7. Creation of a micro - teaching setting. The Indian Model of Micro - Teaching developed by ***NCERTgives the following setting:***

a) Number of student - teachers 5-10

b) Types of pupils: real pupils or preferably years.

c) Types of supervisor: teacher education and peers.

d) Duration of a micro - lesson: 6 minutes.

e) Duration of a micro - teaching cycle: 36 minutes

8. Practicing the skill.

9. Providing feedback.

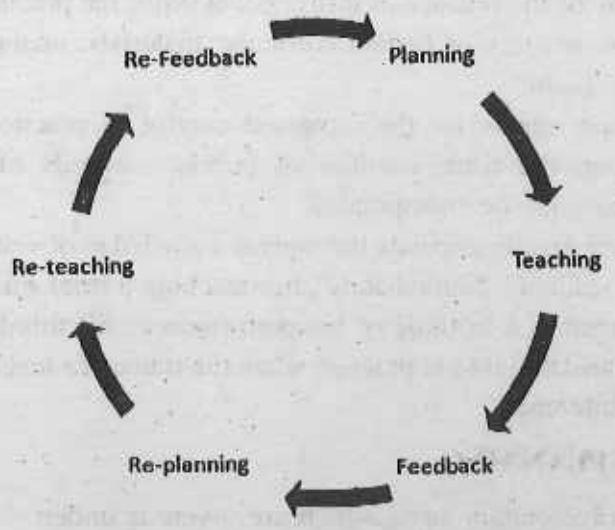
10. Re-planning.

11. Re-teaching.

12. Providing re-feedback.

13. Integration of teaching skills.

Now, a diagram is provided for better understanding of the microteaching process :-



Source : https://en.wikipedia.org/wiki/microteaching.

EVALUATION OF MICRO-TEACHING

Merits of Micro - Teaching: Following are the main advantages of micro - teaching.

1. Superior performance of student teachers on micro -teaching system.
2. Training in real teaching.
3. Increased control of practice.
4. Accomplishment of specific skills.
5. Availability of immediate feedback.
6. Helpful in solving some of the problems involved in student teaching.
7. Helpful in the transfer of general teaching competence to classroom teaching.
8. Helpful in building up confidence of the pupil - teacher step by step.
9. Availability of feedback from different sources:
   - Feedback by the supervising educator
   - Feedback by the peer group
   - Feedback through audio and video-tape recording.
10. Micro lesson preparing the way for macro lesson.
11. Teaching under simulated conditions,
12. Provision of many opportunities to the teacher trainees to observe the derived patterns of behaviour.
13. Lessening the complexities of the normal classroom teaching by 'scaling down teaching'.
14. Facilitating the combination of a number of teaching devices.

Limitations of Micro - Teaching: Important limitations are:

1. Micro - teaching is skill - oriented at the cost of content - orientation.
2. Broad - based patterns of behaviour are not paid their due attention.
3. Scope of developing micro- teaching skills is limited.
4. Micro - teaching does not take into consideration the overall environment of teaching.

The salient features of Indian Model of Micro - Teaching as developed by NCERT are:

1. The model of presenting the skill i.e. modeling is done through written material : lectures, demonstration and discussion and not through films,Video, CCTV as in the case of the advanced technology models of micro - teaching followed in U.S.A and U.K. and other countries.
2. Live observers are used to observe teaching for providing feedback to the

student teachers in the Indian mode, while CCTV is used in the developed countries. Peer supervisors are used along with college supervisors.

3. The micro - teaching laboratory can function with minimum of facilities according to the available space, material and equipment. Feedback sessions can be organized even in corridors or in open space.

4. The duration of the micro - teaching cycle is as under:

Teach	6 minutes
Feedback	6 minutes
Replan	12 minutes
Reteach	6 minutes
Refeed back	6 minutes
Total	**36 minutes**

COMPARISON BETWEEN MICRO TEACHING AND TRADITIONAL TEACHING

Micro-Teaching	*Traditional Teaching*
1. Micro skill based teaching prectice.	1. Wholistic skill based teaching prectice.
2. Duration of time for teaching is 5 to 10 minutes.	2. The duration is 40 to 50 minutes.
3. There is immediate feedback.	3. Immediate feedback is not available,
4. Teaching is carried on under controlled situation.	4. There is no control over situation.
5. Teaching is relatively simple.	5. Teaching becomes complex.
6. The role of the supervisor is Specific and well defined to improve teaching.	6. The role of the supervisor is vague.
6. Patterns of class room interaction can be situated objectively.	6. Pattern of classroom interaction cannot be studied objectively.

Micro - Teaching and Macro - Teaching

Micro- Teaching is a technique of imparting training to would - be - teachers in the art of teaching by practicing specific teaching skills through scaled down teaching encounter i.e. reducing the complexities of teaching in terms of the size of the class,

time and content. By macro-teaching we mean the teaching in regular classes consisting of 40 or more students of 5 minutes. In macro - teaching all the skills of teaching are to be integrated. Let us sum up:

Teaching as a process encloses various variables like inputs, process and outputs. In terms of system analysis of teaching as a process, it is seen that there are many dependent, independent, intervening and extraneous variables/factors that contribute to the quality judgement of teaching as a process. Apropos to this, teaching rests on some principles and maxims which act as guidelines to the efficacy of teaching process. In order to assess the quality or performance of teaching, observation of teacher/teaching behavior comes to play. There are many types of techniques of observation. However, here you came across the Flanders's interaction Category Analysis system (FIACS). The entire route to decipher the efficiency of teaching is systematically dealt.

6.7 Let Us Sum Up

This unit reflected a basket of information, knowledge and understanding of the basics of teaching, its maxims, and various systematic variables involved in the process of teaching. Having elaborated this concept, the basic idea and observation of classroom behavior of a teacher has been dealt with precision following FIACs and its course of interpretation. In order to enhance or rectify teaching skills and competencies of a teacher, micro-teaching as a skill-training process has been discoursed and its difference with traditional teaching has been addressed here. Micro-teaching procedure as envisaged by the NCERT, New Delhi has been documented here for contextual understanding. In a nutshell, this unit provides a basket of a small aspect of pedagogical groundwork in education.

6.8 Unit End Exercises

1) What is teaching?
2) What is system approach? i
3) Mention some significant factors affecting teaching.
4) Give examples of input, process and output elements.
5) Briefly state the system approach to describe teaching as a process.
6) List few maxims of teaching.
7) Write the full form of FIACS.

8) What is meant by teacher talk and student talk in FIACS?

9) Define microteaching.

10) State some of the microteaching skills as per NCERT.

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Unit 7 ❑ Teacher and Classroom Teaching

Structure

7.1 Introduction

A teacher's role may vary among cultures. Teachers may provide instruction in literacy and numeracy, craftsmanship or vocational training, the arts, religion, civics, community roles, or life skills. Formal teaching tasks include preparing lessons according to Prescrifed curricula, giving lessons, and assessing pupilrprogress.

A teacher's professional duties may extend beyond formal teaching. Outside of the classroom teachers may accompany students on field trips, supervise study halls, help with the organization of school functions, and serve as supervisors for extracurricular activities. In some education systems, teachers may have responsibility for student discipline.

Teaching is a highly complex activity. This is because teaching is a social practice that takes place in a specific context (time, place, culture, socio-political-economic situation etc.) and therefore reflects the values of that specific context. Factors that influence what is expected (or required) of teachers includes history and tradition, social views about the purpose of education, accepted theories about learning, etc.

Teachers play vital roles in the lives of the students in their classrooms. Teachers are best known for the role of educating the students that are placed in their care.

Beyond that, teachers serve many other roles in the classroom. Teachers set the tone of their classrooms, build a warm environment, mentor and nurture students, become role models, and listen and look for signs of trouble.

Teachers also play an important role in the classroom when it comes to the environment. Students often follow a teacher's actions. If the teacher prepares a warm, happy environment, students are more likely to be happy. An environment set by the teacher can be either positive or negative. If students sense the teacher is angry, students may react negatively to that and therefore learning can be impaired. Teachers are responsible for the social behavior in their classrooms. This behavior is primarily a reflection of the teacher's actions and the environment she sets.

7.2 Objectives

Upon completion of the unit, you will be able to:

- Explain the nature of classroom teaching.
- Gain an understanding of approaches to student's learning in the context of different thoughts/theories of learning like Behaviourism, Cognitivism and Constructivism.
- Outline the characteristics of a good teacher and various functions of a teacher.

7.3 Nature of classroom teaching

Classroom Teaching refers to the wide variety of skills and techniques that teachers use to keep students organized, orderly, focused, attentive, on task, and academically productive during a class.Classroom teaching is an interaction between teachers and learners and between learners and learners.

Class room discourse is an indispensable element of teaching and learning. It is the teacher's capability to handle learner's contributions which will settle the success or failure of a lesson. The present discussion focuses on classroom teaching and the significance of classroom discourse, the nature of classroom discourse, the mode of interaction in the classroom, the types of classroom interaction and the role of teacher. Finally, it is concluded that to what extent the teacher should be experienced to manage the classroom in a communicative way.

Classroom teaching is an interaction between teachers and learners and between learners and learners. It is generally claimed to form an isolated discourse domain. Teachers and students construct an understanding of their roles and relationships, and

the expectations for their involvement classroom. To be successful, students must develop the communicative competence. Goal of the presentation classroom interaction in condition is very pleasant for any learning.

Significance of Nature of Classroom Teaching

It brings clarity and distinctiveness in the speech. During interaction teachers have the scope to identify the talent, intelligence and excellence of the learners. Learners can be prompted to think and do something new in subject area. It provides learner the scope of speaking and probing into his/her subjects. Learners can acquaint-themselves with the new topics of interactions.

Nature of classroom interaction belongs to both teachers and learners. Teacher and learners bring their own agenda to the classroom. Human interaction creates a context in which further interaction occurs.

Types of classroom interaction:

Keeping the goal of learning through interaction, it can be classified as: Collaborative learning, Interaction, Discussion and Debate. Interaction, Interactive Session Interaction, Conversation with Learners, Interaction, Loud Reading Interaction, Story Telling Interaction, Role-play Interaction, Soliloquies Interaction etc. Some of the prevalent styles of teaching are:

The Authority, or lecture style

The authority model is teacher-centered and frequently entails lengthy lecture sessions or one-way presentations. Learners are expected to take notes or absorb information.

- **Pros:** This style is acceptable for certain higher-education disciplines and auditorium settings with large groups of learners. The pure lecture style is most suitable for subjects like history, which necessitate memorization of key facts, dates, names, etc.
- **Cons:** It's a questionable model for teaching children because there is little or no interaction with the teacher. Plus, it can get a little snoozy. That's why it's a better approach for older and more mature students.

The Demonstrator, or coach style

The demonstrator retains the formal authority role by showing students what they need to know. The demonstrator is a lot like the lecturer, but their lessons include multimedia presentations, activities, and demonstrations.

- **Pros:** This style gives teachers opportunities to incorporate a variety of formats including lectures and multimedia presentations.

- **Cons:** Although it is well-suited for teaching mathematics, music, physical education, arts and crafts, it is difficult to accommodate students' individual needs in larger classrooms.

The Facilitator, or activity style

Facilitators promote self-learning and help students develop critical thinking skills and retain knowledge that leads to self-actualization.

- **Pros:** This style trains learners to ask questions and helps develop skills to find answers and solutions through exploration; it is ideal for teaching science and similar subjects.
- **Cons:** Challenges teacher to interact with learners and prompt them toward discovery rather than lecturing facts and testing knowledge through memorization. So it's a bit harder to measure success in tangible terms.

The Delegator, or group style

The delegator style is best suited for curriculum that requires lab activities, such as chemistry and biology, or subjects that warrant peer feedback, like debate and creative writing.

- **Pros:** Guided discovery and inquiry-based learning places the teacher in an observer role that inspires learners by working in tandem towards common goals.-
- **Cons:** Considered a modern style of teaching, it is sometimes criticized as eroding teacher authority. As a delegator, the teacher acts more as a consultant rather than the traditional authority figure.

The blended style

Blended style, follows an integrated approach to teaching that blends the teacher's personality and interests with students' needs and curriculum-appropriate methods.

- **Pros:** Inclusivel and enables teachers to tailor their styles to learner needs and appropriate subject matter.
- **Cons:** Hybrid style runs the risk of trying too many things to all students, prompting teachers to spread themselves too thin and dilute learning.

Because teachers have styles that reflect their distinct personalities and curriculum—from math and science to English and history—it is crucial that they remain focused on their teaching objectives and avoid trying to all things to all learners.

Role of Teacher :

A teacher keeps a learning atmosphere congenial. A teacher encourages the learners to have a go for some innovative idea, plan and strategies. A teacher has the chance of sharing the advantages of group interactions. A teacher must be caring enough to study the gesture and body language of the learners.

Usefulness of Classroom Interaction:

It is a two way-street. Clarity is achieved through regular participation between both the teachers and the learners. So learners gain confidence and assurance to present themselves in front of many. Both teacher and learner are equally benefitted through equal participation.

7.4 Approaches to student learning: Behaviourism, Cognitivism and Constructivism; Differences between traditional and constructivist teaching

Learning theories are an organized set of principles explaining how individuals acquire, retain, and recall knowledge. By studying and knowing the different learning theories, we can better understand how learning occurs. The principles of the theories can be used as guidelines to help select instructional tools, techniques and strategies that promote learning. Three common learning theories is education are : Behaviourism Cognitive Information Processing (Cognitivism) and Constructivism

Behaviourism

Behaviourism is the school of thought that seeks to measure only observable behaviors. Hence, it only examines outward behavior when trying to understand if learning has occurred. Behaviourism stems from the work of John Watson, B.F. Skinner, and Ivan Pavlov. These Behaviourism theorists believe that knowledge exists independently and outside of people. They view the learner as a blank slate who must be provided the experience. Behaviourists believe that learning actually occurs when new behaviors or changes in behaviors are acquired through associations between stimuli and responses. Thus, association leads to a change in behavior. There are three types of behavioural learning These are:

1. Classical Conditioning (Ivan Pavlov) - Learning through association.
2. Operant Conditioning (B.F, Skinner) - Learning through consequences
3. Observational Learning - Learning through observation

1. Classical Conditioning

Classical conditioning is a learning process in which an association is made between two stimuli. With classical conditioning, two stimuli are linked together to produce a new learned response. One stimulus is a neutral and the other evokes a natural response. After learning the association, the neutral stimulus elicits the conditioned response. The theory of classical conditioning was introduced by Russian physiologist, Ivan Pavlov. Pavlov conducted his classic experiment involving dogs. In his experiment, he conditioned the dogs to associate the sound of a bell with the presence of food. He paired the smell of food which was the naturally occurring stimulus with the neutral stimulus of a ringing bell. Once an association had been made between the two, the sound of the bell alone could elicit a response. The dogs responded to the sound of the bell by salivating. In his experiment, the bell was neutral stimulus since the bell itself did not produce the dogs' salivation. However, by pairing the bell with the stimulus of the smell of the food, which did produce the salivation response, eventually, the bell by itself was able to trigger the salivation response. Thus, the "conditioning" was achieved when the sound of the bell on its own was able to make the dogs salivate in anticipation for the food.

2. Operant Conditioning

Operant conditioning is a learning process in which responses are controlled by consequences. The likelihood of a certain response occurring is either increased or decreased due to either a reinforcement or a punishment consequence. A reinforcement helps to increase a behaviour, while a punishment helps to decrease a behaviour. The term operant conditioning was coined by a behaviorist B.F. Skinner. Skinner conducted experiments with rats using a device called the Skinner box. The box was a cage set up so the rats could automatically get a food reward if they stepped on a lever. The lever caused food to be released. From these experiments, Skinner observed how reinforcement could lead to increases in behaviours where punishment would result in decreases in behaviours.

Reinforcement

Reinforcement is a consequence that increases the likelihood a response will occur. If you are using reinforcement, you are trying to increase a behavior. There are two types of reinforcement. These are Positive reinforcement and Negative reinforcement

Positive means adding a stimulus, while negative means removing a stimulus. Thus, positive reinforcement is the addition of a good stimulus after a response in

order to encourage the response to continue. An example of this would be giving someone praise after a desired behaviour is displayed.

In contrast, negative reinforcement is the removal of an undesirable stimulus after a response so that the response will occur more often. An example of this would be fastening your seatbelt in a car so the beeping sound will stop. Since the undesirable stimulus is removed when you fasten your seatbelt, you are encouraging to fasten your seatbelt. Negative reinforcement is often confused with punishment because of its name. However, negative reinforcement involves removing a negative consequence to increase a behaviour, while punishment seeks to decrease a behaviour.

Punishment

Punishment is a consequence that decreases the likelihood a response will occur. If you are using punishment, you are trying to decrease a behaviour. There are two types of punishment. These are Positive punishment and Negative punishment.

- Positive punishment is the addition of an undesirable stimulus after a response so that the response will occur less or stop. An example would be to give someone extra work for misbehaving.
- Negative punishment is the removal of a pleasing stimulus after a response so that the response will occur less or stop. An example would be taking away television or video games from a child for misbehaving so he or she will stop misbehaving.

3. Observational Learning

Observational learning or modeling is a process in which learning occurs through observing the behaviours of others and then imitating those behaviors. Observational learning allows for learning without any direct change to behavior. This is why it is not considered strict behaviorism. It is more of a link between behaviorism and cognitive learning. Observational learning is associated with the work of Albert Bandura and his social learning theory. The social learning theory suggests that learning occurs through observation and interaction with other people. Bandura first demonstrated observational learning in his famous "Bobo-doll" experiment. In this experiment, children imitated the actions of adults. After seeing adults hit a doll, children would assault the Bobo-doll. The experiment showed that children learned the aggressive behaviour by observing it.

Learning process of Behaviorism

The learning process is based on objectively observable changes in behaviour.

Behaviour theorists define learning simply as the acquisition of a new behaviour or change in behavior. The theory is that learning begins when a cue or stimulus from the environment is presented and the learner reacts to the stimulus with some type of response. Consequences that reinforce the desired behaviour are arranged to follow the desired behavior (e.g. study for a test and get a good grade). The new behavioural pattern can be repeated so it becomes automatic. The change in behavior of the learner signifies that learning has occurred. Teachers use Behaviorism when they reward or punish student behaviors. Examples and applications of behaviorist learning theory:

- Drill / Rote work
- Repetitive practice
- Bonus points (providing an incentive to do more)
- Participation points (providing an incentive to participate)
- Verbal Reinforcement (saying "well said")
- Establishing Rules

Unfortunately, Behaviorism instruction does not prepare the learner for problem solving or creative thinking. Learners do what they are told and do not take the initiative to change or improve things. The learner is only prepared for recall of basic facts, automatic responses or performing tasks.

Cognitive Information Processing (Cognitivism)

Cognitive information processing is based on the thought process behind the behaviour. The theory is based on the idea that humans process the information they receive, rather than merely responding to stimuli (i.e. that think about what is happening). The changes in behavior are observed, but only as an indicator to what is going on in the learner's head. The learner's mind is like a mirror from which new knowledge and skills will be reflected. Cognitive information processing is used when the learner plays an active role in seeking ways to understand and process information that he or she receives and relate it to what is already known and stored within memory. Cognitive learning theories are credited to Jean Piaget.

Cognitive Development

Jean Piaget offer a new experimentally-verified theory of cognitive development. According to Piaget's theory of cognitive development, he described four stages of cognitive development. These are Sensorimotor Stage, Pre-operational Stage Concrete Operational Stage and Formal Operations Stage.

Sl. No	Stage	Age Range	Description
1	Sensorimotor Stage	0-2 Years	• At these stage children are explorers. They want to see, hear, taste, and touch everything around them. • They generally don't appear to be thinking about what they do - no obvious rationale underlies their motives. • They enjoying their rapidly-improving abilities to move around and take in new experiences. • They use language to catalogue objects in their environment (e.g. "doggie!", "horsey") and make demands of their caregivers. • Sensory stimuli are paired up with voluntary motor responses, and sensory/body coordination is established. Syntax and grammar have not yet been developed, and relations between concepts are vaguely understood at best. • During the late Sensorimotor stage of cognitive development, children begin to learn the concept of "object permanence". In other words, they learn that objects still exist even if they cannot see them.
2	Pre-operational	2-7	• Around age two, children enter the preoperational stage. • They learn how to think abstractly, understand symbolic concepts, and use language in more sophisticated ways. During this stage of cognitive development, children

			become insatiably curious and begin to ask questions about everything they see. • They can imagine people or objects that do not exist (such as a lizard with wings) more readily than younger children, and they like to Years make up their own games. • They understand object permanence, but they still don't get the concept of conservation. They don't understand that changing a substance's appearance doesn't change its properties or quantity. In example of quantity, Piaget poured the exact same amount of water into two identical glasses and asked children whether the glasses contained the same amount of water. The children said that both glasses contained the same amount of water. Piaget then poured the water in one glass into a tall, narrow beaker and repeated the question. This time, the children said there was more water in the cylinder because it was taller.
3	Concrete Operational Stage	7-11 Years	• By the time they are 7 years old, children can understand much more complex abstract concepts, such as time, space, and quantity. • They can apply these concepts to concrete situations, but they have trouble thinking about them independently of those situations.

			• As Jean Piaget pointed out in his theory of cognitive development, the children's ideas about time and space are sometimes varying at this stage, but a basic logic is present that directs their cognitive operations. • Children can learn rules fairly easily, but they may have trouble understanding the logical implications of those rules in unusual situations.
4	Formal Operations Stage	11 Years	• Starting at around 11 years old, children become capable of more abstract, hypothetical, and theoretical reasoning. • They can apply rules to a variety of situations, and engage in counterfactual "if-then" reasoning. "Counterfactual" refers to the fact that the "if is known to be untrue. For example, "if dogs were reptiles, they would have cold blood." Children at the formal operations stage can accept this as valid reasoning, even though the premise is obviously false. • At this stage of cognitive development, formal logic becomes possible and verbal explanations of concepts are usually sufficient without demonstration. Strategy-based games become more enjoyable, whereas rote games like "chutes-and-ladders" become repetitive.

https://www.psychologynoteshq.com/piagetstheory

Learning process of (Cognitivism)

Cognitive learning theorists believe learning occurs through internal processing of information. Unlike behaviourism, cognitive information processing is governed by an internal process rather than by external circumstance. The cognitive approach to learning theory pays more attention to what goes on inside the learner's head and focuses on mental processes rather than observable behaviour. Changes in behaviour are observed, and used as indicators as to what is happening inside the learner's mind. Learning involves the reorganization of experiences, either by attaining new insights or changing old ones. Thus, learning is a change in knowledge which is stored in memory, and not just a change in behaviour.

Examples and applications of cognitive learning theory:

- Classifying or chunking information
- Linking Concepts (associate new content with something known)
- Providing Structure (organizing your lecture in efficient and meaningful ways)
- Real world examples
- Discussions
- Problem solving
- Analogies
- Imagery / providing pictures
- Mnemonics

Constructivism

Constructivism is based on the premise that we all construct our own perspective of the world, based on individual experiences and internal knowledge. Learning is based on how the individual interprets and creates the meaning of his or her experiences. Knowledge is constructed by the learner and since everyone has a different set of experiences and perceptions, learning is unique and different for each person.

Learning Process :

Constructivist theorists believe that learning is a process where individuals construct new ideas or concepts based on prior knowledge and experience. Each of us generates our own mental models, which we use to make sense of our experiences. We resolve conflicts between ideas and reflect on theoretical explanations. Learning, therefore,

is simply the process of adjusting our mental models to accommodate our new experiences. This theory is used to focus on preparing people to problem solve. Therefore, to be successful, the learner needs a significant base of knowledge upon which to interpret and create ideas. Additionally, with Constructivism, outcomes are not always predictable because learners are constructing their own knowledge. Thus, Constructivism does not work when the results always need to be consistent. Examples and applications constructivism:

- Case studies
- Research Projects
- Problem based learning
- Brainstorming
- Collaborative learning / group work
- Discovery learning
- Simulations

So all three theories (Behaviouresus, cognitivision & Constructivism) are important to understand. When deciding which strategies to use, it is important to consider the following factors :

the level of knowledge of the learners
the thought processing demands, and
the desired outcome (generation of new ideas or a single answer)

Differences between traditional and Constructivist teaching: The table below depicts the differences between the two:

CURRICULUM	Curriculum is delivered in small , inconsistent parts and not connected students memories content to pass tests . Research has proven that students are incapable of clarifying how these parts relate to the whole .	Curriculum is delivered whole to part. Teacher focuses on students weakness which require more attention .
EXAMPLE	Student's emphasis on memorizing basic facts such as memorizing the mathematical times tables or	Lessons can include drawing, games, writing and instruction as an alternative to filling out worksheets.

	memorizing reptile and mammals. Students are regarded as blank slates : Just waiting to be filled up with knowledge from the teacher .	Students are regarded as thinkers with emerging theories about the world.
FLEXIBILITY	Students are obligated to abide by a fixed curriculum	Students asking questions are extremely significant.
EXAMPLE	One correct answer is sought , utilizing one 'standard' method	Teacher seeks and value student's questions and points of view.
LEARNING ACTIVITY	Learning activities are based on textbooks and workbooks	Learning activities are based on primary sources of data and manipulative materials.
EXAMPLE	Students memorizing the capital cities of Australia.	Student work in small groups making a map of Australia including the states and capital cities.
THE TEACHERS ROLE	Teachers usually behave in a didactic approach, directly distributing information to students.	Teachers usually play an interactive role with students.
EXAMPLE	Teacher stands at the front of the classroom, dictating content directly from the textbook.	Teacher moves around the classroom, interacting with students in small groups asking questions about their projects.
ANSWER	Teacher obtains the correct answers from the students to validate learning.	Teacher searches for the students' points of view and understanding of concepts.

		Teacher constructs opportunities for students learning through: posing contradictions, presenting new information, questionnaires and research. "Teachers value and seek their students' point of view."(Brooks & Brooks , 1993 , p.lx)
EXAMPLE	Teacher only seeks or dictates the correct answer after reading certain content or viewing a video. Any other answer is incorrect.	Teacher does not provide the correct answer but asks students about their opinions and philosophy after reading certain content or viewing a video.
ASSESSMENT	Assessment of student learning is considered separate from teaching. Assessment occurs almost completely through testing.	Assessment of student learning is intertwined with teaching.
EXAMPLE	Regular test and end of year examinations	Teacher observations of students working in the class room, through student presentations.

7.5 Characteristics of a Good Teacher: Function of a teacher as a Planner, as a Facilitator, as a Counselor, as a Researcher.

A teacher is a 'National Builder'. That is why teaching in a classroom is challenging and physically demanding. There is rarely a moment to sit down. It is mentally and emotionally demanding because it requires that a teacher be constantly alert and always searching for ways to extend the children's discoveries and enhance their learning. Teaching young children can be more difficult and demanding than teaching

older children. It is also tremendously rewarding when you see young children develop into independent and self-confident thinkers, doers, and problem-solvers. That is why a good teacher should be Planner, Facilitator, Counselor and Researcher.

Planner

A good teacher should be a good planner for his/her classroom environment. That's why teacher should be provide in some learning environments. These are:

i. Develop plan and prepare the environment for learning. Because children learn through play, it is essential that you provide the materials and equipment necessary for meaningful play activities that support the development of multiple intelligences.

ii The classroom and the outdoor area must be set up with care so that the children will find interesting, stimulating, meaningful and challenging things to do in an atmosphere that is orderly, safe and has a sense of purpose.

iii. Children also learn best when they feel emotionally safe and supported. When planning your classroom arrangement, always keep in mind the children's ethnicities, cultures, languages and differing abilities.

iv. Make sure that your environment, including your books, music, posters, pictures, dolls, dramatic play props, cooking activities, and the overall tone of interactions, reflects a respect and concern for each child as a unique individual and as a member of a family and a community.

v. In such a carefully planned learning environment, children will learn that school is a happy, safe, and interesting place in which they can explore, discover, and learn about themselves and the world around them. With this belief system in place they are prepared to move forward into the more structured world of "school" with eager anticipation and ready for success.

Facilitator

After planning is finished and children arrive for the day, teacher role shifts to that of a facilitator. It is your job to make sure that every child has the opportunity to experience success and learn according to individual needs, styles, and levels of ability. Move about the classroom and the outdoor area while the children are playing. Watch, listen, and talk with the children during their play.

Ask open-ended questions to help children extend their thinking and stretch their vocabulary. Open-ended questions are those with many possible answers. Some examples of open-ended questions are:

- "What did you notice about the paint in the classroom today?"
- "Tell me about the lemon."
- "Tell me differences between mango an apple."

Counselor

It is not easy for students to share their issues with a teacher. It is important for teachers to be open-minded and willing to help. Building trust in the minds of students is essential if a teacher wants to be a confidant.

Some qualities that encourage students to talk to a teacher are:

- Objectivity in approach: A teacher should view the student in an objective manner and without any personal bias, based on academic records or personality.
- Old-timers: A key person who has been with the institution for a long time, understands the place and the students, is also an ideal candidate for the role of a counsellor. A teacher who is also perceived to be approachable by the students could be identified and trained in counselling.
- Active listening skills: The teacher should show genuine interest in what the student is telling them. They should practice self-control, show patience and supportive body language by nodding their head and responding to the student's cues.
- High level of integrity: For students to share their most troubling issues, the teacher should be trustworthy to not share it with anyone else or worse, gossip about it. For example, no student would want to talk about their disturbed family background, without making sure that the person they are talking to is trustworthy.
- Empathetic and exploratory: A teacher should be empathetic as it helps to understand the issue from the student's perspective.

What should a teacher do when a learner approaches them?

1. **Build rapport:** This is the first step a teacher-counsellor should take. Make the student feel comfortable in your presence, until they are at ease and start to talk. Remember that the student is trying to gauge if you are trustworthy. It is important to use a good combination of verbal and non-verbal communication at this stage.
2. **Allow students to express themselves:** When the student starts talking about the challenges faced, allow them to vent. Listen to everything that the student has to say and do not interrupt the flow of thought. Also, as a teacher, you can paraphrase the student's thoughts to ensure that you have understood the

problem correctly. This will provide clarity to their thought. "This is how I've understood your problem and I believe you can approach it through so-and-so method. What do you think?" This could be one of the ways. Assist the student to think about ways to overcome or address the problem instead of providing ready solutions.

3. **Be non-judgmental:** A teacher should be empathetic and compassionate towards the student. For instance, if a student comes out saying they have had 60 cigarettes per day; the teacher should not say "Oh that's so bad!" One needs to practice self-restraint.
4. **Consistent in emotions:** As a teacher, the person should be consistent in their thoughts and emotions. They should try to not let their moods and emotions rub off on the student who comes to them for help. They should maintain their composure.
5. **Maintain complete confidentiality:** Make the student understand that the information they share will remain confidential and not be leaked to anyone. (If the issues shared by the student are harmful to themselves or others, then it should be brought to the notice of the school management.)

Researcher

Another important characteristic of a good teacher is his/her deep knowledge which manifest in research mindedness about own subject. There is a saying that **'a teacher is only as good as his/her knowledge is.'** After all, he is doing a teacher's job, which is to teach. If he himself/herself lacks in the knowledge of a certain subject that he/she teaches, he is never going to make a name for himself/herself. So, sign up with only that subjects which you have really good expertise; and it is a moral duty too. Otherwise, it is not worth it.

While moving about the learning environment, be alert for special moments of discovery "teachable moments" when a child is on the brink of learning something new. When this happens, move closer and help the child take the new ideas a step or two further. For example, two children have built towers with blocks and they notice that one tower is taller than the other. This is a good time to move in and begin talking with the children about ways in which the towers are the same and ways in which they are different. Suggest measuring the towers and encourage the children to think of ways to do the measuring. They might suggest using a piece of yarn, their hands, their feet, their shoes, a tape measure, or a yardstick. Encourage children to go from that point to measuring other objects in the room, comparing measurements, and "writing" their results on paper. When you are working with children in this exploratory way, always remember that their learning will be less meaningful if you

give them the answer or take over the direction of the activity. When you facilitate children's learning, you are setting things up and providing materials, time, space, and encouragement so that they can find their own answers in their own way and in their own time. That's what early learning is all about. This ensures a consolidate learning among the children as a consequence of investigating instinct of a teacher.

7.6 Let us sum up

The two most important components of education: teacher and classroom teaching have been dealt very systematically in this unit. The characteristics of classroom teaching and its different components have been discussed in details here. The various schools of thought pertaining to student's learning like behaviourism, cognitivism, constructivism etc are presented in such a manner that it provides a better understanding on the part of teaching-learning as a 'whole' component in an education system. The different shades of a teacher, i.e., the roles and responsibilities have been carved to meet the demands and needs of the learners at large. In a nutshell, this unit delves deep into the pedagogical groundwork of an education system.

7.7 Unit end exercise

1. Who is a teacher?
2. Discuss in brief the basic tenets of any two approaches of student's learning.
3. Distinguish in short between traditional and constructivist classroom teaching.
4. List some of the characteristics of a good teacher.
5. Write few lines on 'teacher as a researcher'.
6. What is the significance of'teacher as a counselor'?
7. Why planning is important in teaching?
8. What is meant by a 'classroom'?
9. What are the functions of a facilitator?

7.8 Bibliography

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Unit 8 ❑ Teaching Strategies and Methods

Structure

8.1 Introduction

A teaching method comprises the principles and methods used by teachers to enable learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn.In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity.

Whereas, teaching strategies refer to the structure, system, methods, techniques, procedures and processes that a teacher uses during instruction. These are strategies the teacher employs to assist student learning. Learning activities refer to the teacher guided instructional tasks or assignments for students.

The approaches for teaching can be broadly classified into teacher centred and student centred. In Teacher-centred Approach to Learning, teachers are the main authority figure in this model. Students are viewed as "empty vessels" whose primary role is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge and information to their students. In this model, teaching and assessment are viewed as two separate entities. Student learning is measured through objectively scored tests

and assessments. In Student-centred Approach to Learning, while teachers are the authority figure in this model, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. Teaching and assessments are connected; student learning is continuously measured during teacher instruction.Commonly used teaching methods may include class participation, demonstration, recitation, memorization,inductive, deductive, heuristic, analytic, synthetic etc.

8.2 Objectives

Upon completion, the learners will be able to:

- Identify and understand the various teaching strategies prevalent in the teaching-learning system.
- Discuss and differentiate the different teaching methods used in teaching-learning system.

You will be now introduced with the various teaching strategies and methods in brief.

8.3 Teaching Strategies: Inductive, Deductive, Heuristic, Analytic, and Synthetic.

Inductive Strategy :

Inductive method is an important procedure to prove a universal law. In this method, this is done by showing that if the law is true in a particular condition, then it will also prove to be true in other similar condition at any place of the world. This method proceeds from concrete to abstract and from a specific example to the universal law. As all the scientific principles and conclusions are result of induction, thus this method is considered to be one of the most important methods of teaching science.

Merits of Inductive Strategy

By making use of this method, following merits get accrue to the students as well as to teacher:

a. As this is a scientific method, thus it helps to considerable extent in developing scientific outlook among the students.

b. This method helps to develop scientific attitude among the students.

c. With the help of this method, teacher can develop qualities of critical thinking and habit of keen observation among the students properly and accurately.
d. This is a very logical and psychological kind of teaching science.
e. By this method, students get various opportunities to play an active role in learning process.

Demerits of Inductive Strategy

This method has certain limitations, some of which are as follows:

a. The results or conclusions drawn from such method are not found to be final in case where the amount of data is very large in number.

b. All the topics of science cannot be dealt with this method properly.

c. This method can only be used when teacher have much time for teaching process.

Deductive Strategy

This method is just opposite of Inductive method. In this method, facts are being deduced by application of established formula or experimentation. In this method, one proceed from general to particular principles, from unknown to known and from abstract to concrete facts.

Merits of Deductive Strategy

This method has the following merits:

a. As students of lower classes are being provided with established scientific principles, thus this method can prove to be effective for them.
b. This method is quite time saving as students are not required to analyse the universal principles.
c. Teacher's duty or burden gets lessen to some extent by making use of this method as a result of which teachers find themselves in a comfortable and secured position.
d. Through this method, a teacher can cover the lengthy syllabi of class in shortest period of time.

Demerits of Deductive Strategy

This method suffers from following demerits:

a. As the approach of this method is non-conform and non-explanatory, because

of which it is considered to be an unscientific method of teaching.

b. Through this method, it becomes difficult for the teacher to develop scientific attitude among the students.
c. As in this method, students do not get any opportunity to play active role in learning process, thus, some experts consider it as psychological in nature.
d. Rote memory is being encouraged by this method among the students as a result of which they do not become self-independent.

Heuristic Strategy of Teaching

The term "Heuristic" refers to Armstrong who was the exponent of this strategy. Pollion and Dankar (1945) called it "problem solving". It is based on the psychological principles of "trial and error" theory. Logical and imaginative thinking are perquisites for his type of teaching strategy. It is an economical and speedy strategy.

Meaning of Heuristic Strategy of Teaching

A problem is placed before the learners and they are asked to find the solution of the problem through various literacy means, like library, laboratory, and workshops etc. Teacher's role is to initiate the learning and pupils are active throughout the learning process. By using their creative thinking and imaginative power, they try to find out the relevant solutions based on some logic. They learn by self-experience. This teaching strategy is focused on:

1. To develop problem solving attitude
2. To develop scientific attitudes towards the problem
3. To develop power of self-expression

It basic principles are:

1. To each as little as possible at one time
2. To encourage learner to learn himself as much as possible

Advantages of Heuristic Teaching Strategy

Following are the advantages of Heuristic teaching strategy

1 It helps in achieving cognitive, affective and psychomotor objectives i.e. it helps in all round development of the child.
2. Students are put into the situation to learn by self-experience. It certainly develops self-confidence and self-reliance in the learners.

3. It helps in developing scientific attitude and creativity in the learners.
4. Teacher encourages the learners to explore the environment in search of the solution of the problems. By doing so, some new knowledge is discovered by them.
5. Teacher is always ready to provide individual guidance regarding the solution of the problem. Thus interaction between the teacher and the learner takes place in a cooperative, conducive environment.

Disadvantages of Heuristic Teaching Strategy

1. It cannot be used at primary level of education
2. Higher intelligence and divergent thinking is required in the learners. But, there are some students who are below average and fail to succeed in discovering the solutions of the problems. It frustrates them.
3. In true sense, none of the teachers have patience for providing individual guidance to the learners. And learners, too, feel hesitation to approach the teacher for seeking his help.

Suggestions

1. There can be number of solutions for a problem. So, it is the teacher's duty to provide guidance to the learners to select the most relevant solution of the problem
2. Problem should be related to the course and curriculum and a definite time period should be allotted to the learners to finish their research work.
3. Students' abilities capabilities, interest and choice of the subject should be taken into consideration in allotting the problems.
4. There should be eligibility criteria for providing the problems.

In counties like India and Pakistan, the whole teaching is examination centred, neither teacher nor the pupils have patience to apply this teaching strategy and get the desired results. If some enlightened teachers of science, mathematics, and social sciences apply this teaching method in their teaching, it will help in developing creative, confidence students.

Analytic Strategy:

In this method we proceed from known to unknown. The word 'Analytic' is derived

from the word 'Analysis' which means to break up or to resolve a thing into its constituent elements. Thus in this method we break up the unknown problem into simpler parts and then see how these can be recombined to find the solution. Therefore, it is the process of unfolding of the problem or of conducting its operation to know its hidden aspects. In this process we start with what is to be found out and then think of further steps or possibilities that may connect the unknown with the known and find out the desired result. It is believed that all the highest intellectual performance of the mind is analysis.

Merits of Analytical Strategy

(i) It helps in developing reasoning power of the students.

(ii) It helps in clear understanding of the subject because the students have to go through the whole process themselves.

(iii) In these method student's participation is encouraged.

(iv) It is a psychological method.

(v) No cramming is required in this method.

(vi) This method has little rather no scope for forgetting

(vii) Teaching by this method, teacher carries the class with him.

(viii) It helps in developing a spirit of discovery amongst the students.

(ix) It develops self-confidence in the pupil.

Demerits of Analytic Strategy

(i) It is a time consuming and lengthy method, so it is uneconomical.

(ii) It these method facts are not presented in a neat and systematic order.

(iii) This method is not suitable for all the topics in commerce.

(iv) This method does not find favour with all the students because below average students fail to follow this method.

Applicability

In commerce teaching this method is suitable for complicated problems. It analyses the problem into sub-parts and various parts are reorganised and the already learnt facts are used to connect the known with unknown. This method is particularly

suitable for teaching of Arithmetic, commercial mathematics. It puts more stress on reasoning and development of power of reasoning is one of the major aims of teaching of commerce.

Synthesis

The word "synthetic" is derived from the word 'synthesis which means to combine together. In this method we combine together a number of facts, perform certain mathematical operations and arrive at the solution. In this method we start with the known data and connect it with the unknown part. It is the process of putting together known bits of information to reach the point where unknown information becomes obvious and true. Thus, in this method we proceed from hypothesis to conclusion.

Merits of Synthetic Strategy

(i) It saves time and labour.

(ii) It is a neat method in which we present the facts in a systematic way.

(iii) It suits majority of students.

(iv) It can be applied to majority of topics in teaching of commerce.

Demerits of Synthetic Strategy

(i) It makes the students passive listeners and encourages cramming.

(ii) While teaching by this method, teacher does not carry the class with him,

(iii) This is not a psychological method.

(iv) In this method there is a scope for forgetting.

(v) In this method, confidence is generally lacking in the students.

Application

This method suits the average teacher and the average student. It is a time saving and neat method so teachers usually prefer this method. However, if it follows the analytical method then it gives the best results.

Here is an explicit difference between the two strategies which will help you better understand the concept of these two methods.

Analytic Strategy	Synthetic Strategy
(1) Analysis means breaking up into simpler elements.	(1) Synthesis means building up separate element and their combination
(2) It proceeds from the unknown to the known facts.	(2) It proceeds from the known to the unknown facts.
(3) It is a method of discovery.	(3) It is a method of presentation of discovered facts.
(4) It is a process of thinking (exploration).	(4) It is a product of thought.
(5) It is lengthy and laborious.	(5) It is short and concise.
(6) It pulls apart or breaks up the statement under solution.	(6) It puts together or synthesizes known facts.
(7) It can be rediscovered.	(7) Once forgotten, it cannot be recalled.
(8) It is slow, round-about and involves trial and error.	(8) It is quick, straight forward and does without trial and error.
(9) It answers satisfactorily and question that may arise in the mind of pupil.	(9) It does not satisfy doubts and questions arising in the mind of the leaner.
(10) It is a general method; it is a method for the thinker and discoverer.	(10) It is a special device; it is a method for the crammer.
(11) The students can recall and reconstruct easily any step if forgotten.	(11) It is not that easy to recall or reconstruct any forgotten step.
(12) It develops originality.	(12) It develops memory.
(13) It is informal.	(13) It is informal.
(14) It is formational.	(14) It is simply informational.
(15) It is based on heuristic lines.	(15) There is no heuristic approach in it.
(16) It is fore-runner of 16.	(16) It is the follower of analysis.

8.4 Teaching Methods-Lecture, Discussion, and Demonstration, Story Telling, Problem Solving and Team Teaching.

A **teaching method** comprises the principles and methods used by teachers to enable learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate

and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn. In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity.

Lecture:

A **lecture** is an oral presentation intended to present information or teach people about a particular subject, for example by a university or college teacher. Lectures are used to convey critical information, history, background, theories, and equations. A politician's speech, a minister's sermon, or even a businessman's sales presentation may be similar in form to a lecture. Usually the lecturer will stand at the front of the room and recite information relevant to the lecture's content.

Though lectures are much criticised as a teaching method, universities have not yet found practical alternative teaching methods for the large majority of their courses Critics point out that lecturing is mainly a one-way method of communication that does not involve significant audience participation but relies upon passive learning. Therefore, lecturing is often contrasted to active learning. Lectures delivered by talented speakers can be highly stimulating; at the very least, lectures have survived in academia as a quick, cheap, and efficient way of introducing large numbers of students to a particular field of study.

Lectures have a significant role outside the classroom, as well. Academic and scientific awards routinely include a lecture as part of the honor, and academic conferences often center on "keynote addresses", i.e., lectures. The public lecture has a long history in the sciences and in social movements. Union halls, for instance, historically have hosted numerous free and public lectures on a wide variety of matters. Similarly, churches, community centers, libraries, museums, and other organizations have hosted lectures in furtherance of their missions or their constituents' interests. Lectures represent a continuation of oral tradition in contrast to textual communication in books and other media. Lectures may be considered a type of grey literature.

Lecturing

It is the oldest method given by philosophy of idealism . As used in education , the lecture method refers to the teaching procedure involved in the clarification or explanation to the student of some major idea . This method lays emphasis on the

presentation of the content. Teacher is more active and students are passive but he uses question answer to keep them attentive in the class. It is used to clarify matters, to expand content and motivate the students. By changing his voice, by impersonating characters, by shifting his position and by using simple devices, a teacher can deliver his lesson effectively. While delivering his lecture, a teacher can indicate by his facial expression, gestures and tones the exact shade of meaning that he wishes to convey.

According to James Michael Lee, "The lecture is a pedagogical method whereby the teacher formally delivers a carefully planned expository address on some particular topic or problem." It can be used :

1. To clarify matters.
2. To review significant details of the lesson.
3. To expand contents.

Merits of the lecture method.

Following are the merits of the lecture method :

1. It is economical as it needs no apparatus and no laboratory. A large number of students can be taught at a time.
2. It saves time and covers syllabus in a limited time.
3. It is very effective in giving factual information and in relating some of the thrilling anecdotes. The life stories of great adventures, experimenters, investigators and thinkers can become very interesting and valuable talks by a teacher.
4. Lecturing makes the work of the teacher very simple. He need not make elaborate arrangements.
5. A good lecture not only stimulates the students but also lingers long in their imagination. It motivates students to become good orators.
6. It provides better scope for clarification and for laying stress on significant ideas.
7. It brings a personal contact and touch to impress or influence the pupils.
8. It provides flexibility. As the teacher is in close and intimate contact with his pupils, he can adjust his technique in accordance with their abilities , aptitudes and interests.
9. It gives the students training in listening.
10. It gives the students training in taking notes rapidly.
11. It develops good audience habits.
12. It provides opportunities of correlating events and subjects.
13. It enables the linkage of previous knowledge with the new one.

Limitations.

The limitations of this method are as follows :

1. There is very little scope for pupil activity.
2. It does not take into consideration individual differences.
3. Lecturing is against the principle of'Learning by Doing'.
4. It spoon - feeds the students without developing their power of reasoning.
5. Speed of the lecture may be too fast for the learner to grasp the line of thought.
6. An average student may not be able to fix up his attention to a lecture of forty to forty-five minutes.
7. A lecture is likely to cover more content without realizing that little learning takes place.
8. A lecture may become monotonous to the students after a while. Very few teachers can keep the interest of the students up to the end.

Guide - lines *for the effective use of the lecture* ***method*** . The following points should be kept in view in using this device of teaching:

1. Matter should be arranged in such a way as to leave a single clear impression on the minds of the students.
2. The teacher should have pauses in between the lesson so that the students may learn the new knowledge bit by bit.
3. The rate of exposition should be slow when the class is backward. The teacher should utilize different ways of presenting the same information.
4. There should be abundant repetition but it should be in a new way so that the class may not feel dullness.
5. Children's way of looking at things should be considered in exposition. Language used should be familiar and suitable .
6. The lesson should be divided into sections which have a logical sequence. This will enable the students to understand easily and will also train them in systematic thinking besides assisting them to put their own thoughts logically.
7. The ratio of exposition and the size of the subject - matter are determined by the individual capacity of children and teacher's natural rate of speech.
8. Proper use of the black-board should be made.
9. Actual objects, models, diagrams, sketches etc. should be used.
10. The students should be encouraged to ask questions. This will enable them to get their doubts removed.
11. Verbal illustrations such as examples, comparisons etc., should be used to enable the students to grasp the exposition.

12. Pictorial illustration such as pictures, maps and charts should be freely used as these help in motivating the students.
13. The aim of the lesson should be kept in view and the students fully made conversant with the aim.

Discussion

Meaning and significance of discussion method .

This method has been used in the teaching - learning process since times immemorial. It was widely used at the famous Nalanda University. The Greek scholars in their walk used to discuss various problems and issues with their disciples. Discussion has been described as a thoughtful consideration of the relationship involved in a topic or problem under study. It is concerned with the analysis, comparison, evaluation and conclusions of these relationships. It aims at uniting and integrating the work of the class. It is carried out by organizing, outlining and relating, the facts studied. It encourages the students to direct their thinking process towards the solution of a problem and to use their experiences for a further clarification and consolidation of learning material. Discussion is to be distinguished from debate in which the participants seek to prove a point rather than to discover a truth. Debate may also be marked by uncontrolled exchange of verbalism. Discussion is very important in stimulating mental activity, developing fluency and ease in expression, clarity of ideas in thinking and training in the presentation of one's ideas and facts. An exchange of ideas and opinions offers valuable training to students in reflective thinking.

Discussion may be used for the following purposes:-

(i) For planning new work.

(ii) For making decision concerning future work.

(iii) For sharing information.

(iv) For obtaining and gaining respective for various points of view.

(v) For classifying ideas.

(vi) For inspiring interest.

(vii) For evaluating progress.

Discussion may be formal or informal. Formal discussion is one which proceeds in a predetermined manner and according to set procedures. An informal discussion involves the free verbal interchange of the participants without being governed by predetermined set of rules.

Essential parts or constituents of discussion. These are as under:

1. The leader - the teacher.
2. The group - the students/learners
3. The problem or the topic.
4. The content - body of knowledge.
5. Evaluation - change in ideas, attitudes etc.

Organization of discussion

Following are the main techniques of organizing discussion:

1. Introducing a learner or a problem by the teacher by giving points or explanations to serve as the basis of discussion.

2. Calling upon a pupil by the teacher to give facts, describe a scene or situation, explain an incident, event or happening for getting the discussion started .

3. Preparing an outline of points cooperatively by the teacher and a few students which may become the starting point for discussion.

4. Asking the students to describe their own experiences connected with the subject, topic or problem and making them points for discussion.

5. Presenting detailed papers by the teacher and discussions thereon.

6. Presenting detailed papers by the students and discussing them in the class.

7. Showing special works and projects to the class and discussing them.

8. Showing some pictures, charts, diagrams or any audio-visual material and discussion about them.

Merits of discussion

Following are the merits of discussion:

1. It helps in clarifying issues.

2. It helps children in crystallizing their thinking.

3. It helps students in discovering what they do not know and what they have overlooked.

4. It engenders more reflection. It is farther from rote learning.

5. It represents a type of pooled knowledge, ideas and feeling of several persons.

6. It develops team spirit.

7. It engenders toleration of views which are at variance.

8. It affords opportunities to the learners to learn together, make suggestions, share responsibility, comprehend the topic, and evaluate the findings and to summaries results.

9. It provides opportunities to the learners to speak distinctly, stand and sit correctly, respect the ideas of others, share interests, ask pertinent questions and comprehend the problem before the group.

10. It helps the teacher in discovering talented learners who have potential for becoming good leaders.

Limitations of discussion.

Limitations of discussion are

1. It is not suitable in all topics.
2. It is likely to be dominated by a few students.
3. It is likely to go off the track.
4. It may lead to unpleasant feeling.
5. It may create emotional tensions.
6. It may involve unnecessary arguments.

Demonstration

In teaching through demonstration, learners are set up to potentially conceptualize class material more effectively as shown in a study which specifically focuses on chemistry demonstrations presented by teachers.Demonstrations often occur when students have a hard time connecting theories to actual practice or when students are unable to understand application of theories.

Teachers not only demonstrate specific learning concepts within the classroom, they can also participate in demonstration classrooms to help improve their own teaching strategies, which may or may not be demonstrative in nature. Although the literature is limited, studies show that the effects of demonstration classroom teachers includes a change of perspective in relating to students, more reflection in the teachers' own classroom strategies, and more personal responsibility for student learning.[5]

Demonstration, or clearly showing (a gamut that ranges from mere pointing to more sophisticated strategies such as chemical reactions), can possibly be used in portraying ideas such as defining words. At first, simple observation and communication through pointing to an object, area, or place, like the sun, moon, or a large mountain top, occurs. Then basic definitions of words emerge. These definitions allow humans to communicate, interact, plan, and co-ordinate in ways that help us to build cities, large buildings, technology, gain knowledge and to successfully communicate with computers. Further, basic concepts centred on time, space, and

mathematics are first required to demonstrate and teach probable theories that accurately describe universal phenomenon such as nature, planets, species, and the world around us.

The history of phenomenon demonstrating concepts, which lead to specific definitions, goes back to the careful observations of ancient Greek philosophers and natural philosophy. Socrates, Plato, and Aristotle attempted to carefully define words that included natural phenomena and objects. The modern scientific method often uses demonstrations that carefully describe certain processes and parts of nature in great detail. In science, often one demonstrates how an experiment is done and shows this to others.

People can also communicate values and ideas through demonstrations. This is often done in plays, movies, and film. Pictures without words can show or demonstrate various types of actions and consequences.

When using demonstration, there is a four-step process that will allow the students to have a clear understanding of the topic at hand.

Story Telling

Story telling as an art:

Story telling is one of the most important methods of teaching. It is an art which enables the teacher to come very close to the heart of the students and thereby he attracts their attention. Some teachers are born tellers and they are very fortunate in this respect. This art of storytelling aims at presenting to the pupils, through the medium of speech, clear vivid, interesting , ordered sequences of events , in such a way that their minds reconstruct these happening and they live in imagination through the experiences recounted either as spectators or possibly as participators . Story telling enables the teacher to make lessons lively and interesting to the pupils. Stories of great personalities, reformers, writers, saints, discovers and scientists etc. must be told to the students. Story telling helps in enhancing the interest of the students in the subject. It goes a long way in firing the imagination of the students. Story telling can be relied upon by the teacher as the best companion for helping in developing in his pupils trails of character such as charity, piety, truthfulness and valor etc. The art of storytelling can be cultivated by:

1. Observing skillful narrators.
2. Studying the work of successful story writers.
3. Practicing storytelling
4. Critically evaluating one's own performance and bringing about necessary

changes. In telling a story the teacher should be guided by the following points:

1. Suitable stories for the age of the learners should be selected. A story that appeals and interests the seven year child will not suit the child of four years of age. Small children of 4 or 5 years are interested in stories of boys and girls. The child of 7 or 8 years takes interest in hearing stories of magic and wonder, stories of giants, adventure and romance. learners at the secondary stage take interest in stories of scientific discoveries.

2. The stories should be short with easy plot .

3. The teachers must know the story well that he/she wants to narrate. If he/she stops in the middle, it will detract charm from the story.

4. Language employed in telling a story should be very simple and easy.

5. A story should be told and not read . The story loses a great deal of its interest for the children if it is read.

6. The teacher himself should like the story and take interest in story telling.

7. There should be plenty of action in the stories. Key sentences and phrases should be repeated as the children enjoy this repetition. The stories should be loaded with activities and experiences familiar to the children. R. Strang has observed, "Stories for young children, therefore, should be told in terms of action and sense impression. Upto the age of six years, a child is most alive to moving things - Engines, boats, horses and wagons, animals, boys and girls in action. Children lose interest when the action is interrupted by a long descriptive -passage. In telling a story one can notice the drop in interest during descriptive and explanatory portions, and the flare-up of interest again when the action is resumed. Since the young child's own activities and experiences are the ones most interesting to him, the first stories should be about experiences familiar to children."

8. Conversation, if any, in the story should be given indirect speech and not indirect.

9. The method of introducing and developing the story should be thought out before - hand.

10. The story should be told in a natural way and very vividly.

11. Humour makes the story more interesting and should not be neglected .

12. To make the story more realistic, the teacher may use pictures and draw diagrams on the blackboard.

13. The story should suggest and inspire the students to action.

14. It is suggested that well-known and familiar stories can be made fresh if they are told as though one of the characters in the story were telling it. For eg, "The story

of Ashoka and the Kalinga war could be told as if Ashoka, himself, was telling it."

15. The story must have some aim besides mere enjoyment. The teacher must keep in mind the aim while narrating a story. It is all the more better if the students too know the aim.

Problem Solving

Many instructors in engineering, math and science have students solve "problems". But are their students solving true problems or mere exercises? The former stresses critical thinking and decision-making skills whereas the latter requires only the application of previously learned procedures. True problem solving is the process of applying a method - not known in advance - to a problem that is subject to a specific set of conditions and that the problem solver has not seen before, in order to obtain a satisfactory solution.

Below you will find some basic principles for teaching problem solving and one model to implement in your classroom teaching.

Principles for teaching problem solving

- **Model a useful problem-solving method.** Problem solving can be difficult and sometimes tedious. Show students by your example how to be patient and persistent and how to follow a structured method, such as Woods' model described here. Articulate your method as you use it so students see the connections.
- **Teach within a specific context.** Teach problem-solving skills in the context in which they will be used (e.g., mole fraction calculations in a chemistry course). Use real-life problems in explanations, examples, and exams. Do not teach problem solving as an independent, abstract skill.
- **Help students understand the problem.** In order to solve problems, students need to define the end goal. This step is crucial to successful learning of problem-solving skills. If you succeed at helping students answer the questions "what?" and "why?", finding the answer to "how?" will be easier.
- **Take enough time.** When planning a lecture/tutorial, budget enough time for; understanding the problem and defining the goal, both individually and as a class; dealing with questions from you and your students; making, finding, and fixing mistakes; and solving entire problems in a single session.
- **Ask questions and make suggestions.** Ask students to predict "what would happen if ..." or explain why something happened. This will help them to

develop analytical and deductive thinking skills. Also, ask questions and make suggestions about strategies to encourage students to reflect on the problem-solving strategies that they use.

- **Link errors to misconceptions.** Use errors as evidence of misconceptions, not carelessness or random guessing. Make an effort to isolate the misconception and correct it, then teach students to do this by themselves. We can all learn from mistakes.

Steps of Problem-Solving:

1. Define the problem
2. Think about it
3. Plan a solution
4. Carry out the plan
5. Look back

Encourage students to reflect. Once a solution has been reached, students should ask themselves the following questions:

- Does the answer make sense?
- Does it fit with the criteria established in step 1?
- Did I answer the question(s)?
- What did I learn by doing this?
- Could I have done the problem another way?

Team Teaching

We have been taught in schools in different ways, teacher used various visual aids, gestures with nursery rhymes and so on. As we grew we had PowerPoint presentations for better understanding.

But most of the time one teacher is assigned to each subject and she would be teaching to students as mentioned in the course book. Mostly the conversation is limited. Only the teacher speaks and the student listens.

A normal lecture is of 45 mins, but do you know the average attention span of humans is not more than 5 minutes. Moreover, it is a proven fact that humans have nearly 45- 50 thoughts in a minute. You might evaluate from this, how distracted we are, how ineffective the learning is.

Every now and then teachers have been inventing ways to make students understand things better. But until and unless there is active participation from learner, he will not have effective learning.

For this reason, team teaching is found to be very effective as it involves students actively. It involves mental and physical simulation of learners.

Meaning of team Teaching:

As the name suggests it is a group of teachers, working as a team and teaching. The team can range from 2 to 5 teachers who will teach the same group of students.

The different type of teaching may include- Teaching a same group at the same time, shared teaching as per the area of expertise or teaching different subgroup within a large group of students.

Advantages of Team Teaching in Education:

1. Low cost:

One can get an efficient form of learning at very low cost; as such no new resources are required to start team teaching.

2. Support to teachers:

Many a time, teachers are overburdened with the fact that they have to complete the curriculum by the end of the term, even if they have creative ideas to teach students they do not have enough time to plan and impart the same to the students.

Moreover it can also happen that teachers have ideas but need guidance to develop the skill and impart the same to the students.

Team teaching eliminates such problems and other problems of similar kind. When teachers collaborate they could play on their strengths and weaknesses and together as a team can make a successful way to teach and learn.

3. Closer integration of staff:

Very often teachers in schools and colleges lack bonding and friendship among themselves. Even worse a competitive environment is seen among the teachers.

The main motive of educational institutes is to impart value to students and work as a whole for being efficient knowledge importers. Envy or competition among teachers can have negative impact on the Institute and on the student's mind.

With team teaching, teachers are bound to bond, as frequent discussions and planning make them develop a good relation. A happy staff can effectively inculcate the vision of Institute

4. Variety of ideas:

When teachers come together their teaching style, ideas and expertise come together, if planned perfectly, the mixture of best ideas and styles will put forth many ways out of a single topic. It thus helps in better learning

5. Better involvement of learners:

A new method is always appealing; students might wonder what new thing they are going to learn. A team of teacher will have various ways and ideas to put forth, which make the students, put on their thinking cap and question 'why' for all things. They will come up with various questions, queries and ideas.

A dynamic discussion session will increase student's involvement and thus helps in bringing out the best in students

6. Mental simulation to students:

In traditional lecture only one teacher is teaching, the ideas, thoughts are only one way. Often students are forced to accept whatever taught and they do not bother to think the other way around.

Team teaching helps them question the theories and facts. When the students are totally involved it brings out the creativity and the habit of questioning things.

7. Breaks traditional lecture boredom:

Let's be very honest, in lectures we are often distracted, either chatting with our friends, or checking our phones. Or maybe jotting down notes, in all the mentioned cases we are giving divided attention.

An interactive session, debates, help of visual aids and the like evokes interests among students. Team teaching exactly does that,

8. Better bonding between student and teacher:

Humans bond when they interact, it is as simple as that. The bonding is increased when teachers often ask questions and listens to what students have to say. People when heard and appreciated will ultimately be more engaged.

9. Provokes participation / interaction:

Teachers will often find students who rarely participate in any activity and are aloof, mostly students with shy personality will not speak much in class. But during team teaching variety of ideas are put forth.

A perfectly planned lecture will provoke even the most notorious and most aloof people to be engaged. Team teaching helps teachers deal with students of all personalities well and get better engagement

10. Imparts the lesson of team management:

When students see the way teachers work in team, they indirectly get the lesson of

team management and importance of working in a team. Everyone in their career will need to work in teams.

Students get to see how teachers capitalize on each of their strengths how they respect each other's ideas and how as a whole they put the best picture forward. Indirectly, team teaching is helping reduce the extra lecture of team management.

11. Develops interpersonal skills and logic of students:

Student's interaction and logic is improved drastically as they learn to question things and learn how to communicate their ideas effectively.

While in case of a debate, students get to learn how to respect the contradicting ideas, accept them and also tell their own thoughts in return.

12. Teachers can give individual attention:

When a teacher is teaching solely, he or she cannot give attention to the students who has problem learning. The main focus is to make the whole group of student understand at a same time. But we all know that all students are different and everyone has their own learning pace.

In team teaching if one teacher is speaking the other one can solve the queries student raises, without disturbing the whole class.

13. Staff development:

There is no limit to learn, provided if one wishes to, team teaching gives teachers an opportunity to learn and grow themselves.

Teachers also get a chance to brush up their skills, work up to their fullest potential and along with that their creativity, motivation and team management skills get a solid boast too.

14. Long term knowledge retention:

With a dynamic and interactive session students are engaged and they learn better. The knowledge retention is much higher than the traditional learning approach

Disadvantages of Team Teaching:

1. Acceptance of change by teachers:

Let's face it, we humans dislike change, Teachers may not accept the idea of team teaching, they are often rigid and want to stick to the traditional teaching techniques. The idea that they will have to put extra effort and work hard makes them reluctant.

Team teaching can only be effective if teachers are willing and happy to involve in the new form of teaching. A forced approach is bound to fail.

While traditional teaching has been an attempted and-tried technique, likewise it has disadvantages of traditional teaching; especially nowadays the innovation has improved adapting, more fun and intelligent.

2. Rigidity in teachers:

Apart from accepting the change in form of teaching, teachers often have rigidity to accept and adjust with other teachers, while working in a team we have to accept others idea and drop ours. Teachers should not have ego and should handle criticism openly.

3. Bad team management:

Internal coordination and good team tempo is extremely important, internal conflict may result to a complete failure.

4. Personality conflict:

People with contradicting personality must devise a way to work together effectively. A dominating person, will overpower other people, a collaborative approach will help everyone grow and devise effective process of team teaching.

5. Inability to complete curriculum:

While devising creative curriculum & engaging students in interactive session, the curriculum may fall behind.

Though creative teaching is necessary, it is also important for completing the course syllabus. This is one of the major challenges faced during team teaching.

6. Time for coordination and planning:

Teachers have to take out time from their busy schedules and sit together to devise the lecture flow and activities that has to be carried out.

Many a times you could find them juggling through their own work and the time required for planning out the course

7. Hard to keep track:

The sessions at times can get super interactive and teachers will forget the link. The teachers have shared responsibility and have an individual role to play. If any one of the teacher is absent for some reason then the whole session will be jeopardized.

8. Takes time to develop:

Teachers will have to refer many books and talk to several veteran teachers for designing effective teaching plan.

It will also involve deep research and planning out activities which will be appealing to students. Thus it takes lots of time and efforts before even starting a session.

9. Going overboard:

While being creative and lining up to many activities, it could get way beyond the required amount.

A little simulation to students brain will bring the best in them, but if it gets too much they will find it too hard to comprehend. One needs to find the right amount.

10. Resistance from students:

Since childhood, students get used to the traditional form of teaching, they like the structure and the repetitiveness of the lectures. Most probably they have devised their own ways to make it work, a sudden change in the style of teaching will make them confused and they might resist the change.

Some Students like the basic lecture and then they do their self study to learn in deep about it. You could find students coming up with specific problems that they find difficult.

Teaching them everything in detail and inculcating activity, debate or different methods to teach a same topic may make them feel that their time is getting wasted.

11. Takes time to develop:

This new teaching style is fresh to students as well as teachers. Teachers would not have perfect coordination at the first go, they will have to do many trails for reaching a most effective format. There can be overlap of ideas among teachers or they could not impart whatever they thought of.

It could also happen that they overestimated or underestimated the time required to complete the planned tasks. If one of the teacher finds it to difficult to carry out and opts out of it then the whole team will be disrupted.

Teachers can also face resistance from the students. Too many ideas and discussion will make the classroom chaotic. Patience from teachers as well as students is required for a successful team teaching

12. Expectation of higher compensation:

If we compare the efforts required for teaching solely with the efforts required to

teach in a team, then the later one is undoubtedly much harder and would require deep study, time and planning.

Thus teachers may demand higher salary. It could ultimately bring financial pressure on the educational institute.

Necessary Skills Required in the Team of Teachers:

1. A team of teachers with various set of skills prospective and expertise.
2. Vision and sense of direction.
3. Ability to coordinate internally.
4. Excellent team planning.
5. Friendly nature and ability to keep the environment conducive.

Tips To Make Team Teaching Effective:

1. Openness of mind- Teachers and students must be open to change and must embrace this new form of learning.

2. An effective strategy is necessary which requires undivided attention and time, willingness to make the learning effective. Strategy should involve coverage of course syllabus, activities and quizzes to be carried out, a flow of lecture and documenting and developing database of the same,

3. Regular meetings and follow up.

4. Rotation of roles to enhance learning and reduce boredom.

5. Effective way to assess student's performance.

6. Respecting others idea.

7. Training to new teachers who are new to the concept of team teaching.

We can see the advantages outweighs the disadvantages if done properly team teaching can be an effective tool for successful learning. Though it requires a lot of efforts and coordination, it promotes overall growth and development for teachers and students.

8.5 Let Us Sum Up

This unit introduced and gave an explicit description of how to teach. The various strategies and methods of teaching, their merits and limitations in delivering any teaching-learning discourse have been systematically dealt. The unit dealt with some potent traditional methods of teaching, whereas some contemporary methods have been also discussed in the light of contextualisation in Indian perspective.

8.6 Unit end exercise

1. Define teaching.
2. What is a method and a strategy?
3. Give some examples of strategies.
4. Differentiate between inductive and deductive strategies of teaching.
5. Write down some merits of heuristic strategy.
6. List few limitations of team-teaching method.
7. Describe briefly the steps of problem-solving method.
8. What are the characteristics of story-telling method?
9. Give few advantages of demonstration method.
10. Distinguish between 'strategy' and 'method'

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মানুষের জ্ঞান ও ভাবকে বইয়ের মধ্যে সঞ্চিত করিবার যে একটা প্রচুর সুবিধা আছে, সে কথা কেহই অস্বীকার করিতে পারে না। কিন্তু সেই সুবিধার দ্বারা মনের স্বাভাবিক শক্তিকে একেবারে আচ্ছন্ন করিয়া ফেলিলে বুদ্ধিকে বাবু করিয়া তোলা হয়।

— রবীন্দ্রনাথ ঠাকুর

ভারতের একটা mission আছে, একটা গৌরবময় ভবিষ্যৎ আছে, সেই ভবিষ্যৎ ভারতের উত্তরাধিকারী আমরাই। নূতন ভারতের মুক্তির ইতিহাস আমরাই রচনা করছি এবং করব। এই বিশ্বাস আছে বলেই আমরা সব দুঃখ কষ্ট সহ্য করতে পারি, অন্ধকারময় বর্তমানকে অগ্রাহ্য করতে পারি, বাস্তবের নিষ্ঠুর সত্যগুলি আদর্শের কঠিন আঘাতে ধূলিসাৎ করতে পারি।

— সুভাষচন্দ্র বসু

Any system of education which ignores Indian conditions, requirements, history and sociology is too unscientific to commend itself to any rational support.

— Subhas Chandra Bose

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