NETAJI SUBHAS OPEN UNIVERSITY

STUDY MATERIAL

M. Ed. Special Education
(Hearing Impairment / Intellectual Disability) - ODL

A 2

PSYCHOLOGY OF DEVELOPMENT AND LEARNING

M. Ed. Spl. Ed. (H.I. / I.D.)
ODL Programme

AREA - A

A 2 : PSYCHOLOGY OF DEVELOPMENT AND LEARNING

A COLLABORATIVE PROGRAMME OF
NETAJI SUBHAS OPEN UNIVERSITY
AND
REHABILITATION COUNCIL OF INDIA

AREA - A
DISABILITY SPECIALIZATION
COURSE CODE - A 2
PSYCHOLOGY OF DEVELOPMENT AND LEARNING

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The Self Instructional Material (SIM) is prepared keeping conformity with the M.Ed.Spl. Edn.(HI/ID) Programme as prepared and circulated by the Rehabilitation Council of India, New Delhi and adopted by NSOU on and from the 2020-2022 academic session.

Mohan Kumar Chattopadhyay
Registrar

Prologue

I am delighted to write this foreword for the Self Learning Materials (SLM) of M Ed in Special Education (ODL). The M Ed in Special Education in ODL mode is a new academic program to be introduced at this University as per NOC issued by the Rehabilitation Council of India, New Delhi and subject to approval of the program by the DEB-UGC.

I must admire the emulation taken by the colleagues from School of Education (SoE) of NSOU for developing the Course Structure, Unit wise details of contents, identifying the Content Writers, distribution of job of content writing, editing of the contents by the senior subject experts, making DTP work and also developing E-SLMs of all the 16 Papers of the M.Ed Spl.Ed (H.I/I.D)–ODL program. I also extend my sincere thanks to each of the Content Writers and Editors for making it possible to prepare all the SLMs as necessary for the program. All of them helped the University enormously. My colleagues in SoE fulfilled a tremendous task of doing all the activities related to preparation of M.Ed in Spl Edn SLMs in war footing within the given time line.

The conceptual gamut of Education and Special Education has been extended to a broad spectrum. Helen Keller has rightly discerned that *"Have you ever been at sea in a dense fog, when it seemed as if a tangible white darkness shut you in and the great ship, tense and anxious, groped her way toward the shore with plummet and sounding-line, and you waited with beating heart for something to happen? I was like that ship before my education began, only I was without compass or sounding line, and no way of knowing how near the harbour was. "Light! Give me light!" was the wordless cry of my soul, and the light of love shone on me in that very hour."* So education is the only tool to empower people to encounter his/her challenges and come over being champion. Thus the professional Teacher Education program in Special Education can only groom the personnel as required to run such academic institutions which cater to the needs of the discipline.

I am hopeful that the SLMs as developed by the eminent subject experts, from the national as well as local pools, will be of much help to the learners. Hope that the learners of the M.Ed Spl Edn program will take advantage of using the SLMs and make most out of it to fulfil their academic goal. However, any suggestion for further improvement of the SLMs is most welcome.

Professor (Dr.) Subha Sankar Sarkar
Vice-Chancellor, NSOU

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AREA - A

A 2: PSYCHOLOGY OF DEVELOPMENT AND LEARNING

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A 2 ◘ PSYCHOLOGY OF DEVELOPMENT AND LEARNING

Unit - 1 □ Overview Educational Psychology

Structure

1.1 Introduction

In this age of modern science and technology, psychology has been considered as one of the youngest yet one of the most influential sciences. It has influenced education in many different ways and has given a new turn to the human mind

The subject psychology has two aspects pure and applied. Pure psychology formulated techniques for the study of human behavior which finds the practical shape in its applied aspects. Educational psychology is considered as a branch of applied psychology

Further, Educational Psychology is one of the branches of psychology to study the behavior of the learner in relation to his education. This stream of Psychology is concerned about suggesting ways and means of improving the process and products of education enabling the teacher to teach effectively and the learners to learn efficiently with the minimum efforts.

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 behavior and experiences of the pupils in different situations.

It is thus designated as service of education. It has simplified the tasks and improved the efficiency of the teacher and all those connected in the process and products of education by supplying them with the essential knowledge and skills. It has done it in the same way as science and technology has helped in making possible maximum output through minimum input in terms of time and labor in our day to day activities. In order to develop a clear understanding of the term educational psychology, it is necessary to understand the meaning of psychology and education separately

PSYCHOLOGY

The term psychology is derived from the Greek words Psyche and Logos. Psyche means soul and Logos means Science Thus Psychology was first defined as the science of soul.

The interest in psychology as a discipline began at the time of plato, Aristotlre and other philosophers. But it had its formal beginning when Wilhelm Wundt established the first Psychology laboratory at Leipzig, Germany.

In 18th century Psychology was understood as the science of mind. William James (1892), defined Psychology as the science of mental processes. But the word mind is also quite ambiguous as there was confusion regarding the nature and function of mind.

Modern Psychologists defined Psychology as the science of consciousness.

James Sally defined Psychology as the science of inner world. Wilhelm Wundt defined Psychology as the science which studies the internal experiences. But there are three

levels of consciousness, conscious, subconscious and the unconscious and so this definition was not accepted by some.

Reviewing the status of Psychology we can say that Psychology first lost its soul, then its mind and then its consciousness. Further as William McDougall defined Psychology as the science of behaviour is well accepted till date. W. B. Pillsbury and J. B. Watson also defined Psychology as the science of behavior.

Behavior generally means overt activities which can be observed and measured scientifically. But the behavior of an individual is influenced by ones experiences. So not only behavior but also the experiences of an individual should be taken into consideration while defining Psychology

Psychology should therefore be defined as a science of behavior and experiences on human beings (B. F. Skinner)

Ref John Parankimalil.wordpress.com

EDUCATION

The word education is derived from Latin word *educare* which means to bring up Another Latin word *educere* is also mentioned as the source of Education. *Educere* means to lead out. Education can be defined as the process of imparting or acquiring knowledge and habits through instruction or study. It can also be defined as a process in which human behavior is modified so as to be in closer agreement with some model or ideal determined by the values of society.

If education is to be effective it should result in changes in all the behavioral components.

Education by all means is an attempt to mould and shape the behavior of the pupil. It aims to provide desirable changes in him for the all- round development of his personality.

DEFINITION

Now the term educational psychology can be defined in the following way:

According to Charles E Skinner, Educational Psychology is the branch of Psychology which deals with teaching and learning

According to Crow and Crow Educational Psychology describes and explains learning experience of an individual from birth to old age.

According to William Clark Trow educational psychology is the study of psychological aspects of educational situations

According to Stephen educational psychology is the systematic study of the educational growth and development of a child

As F. A. Peel stated Educational Psychology is the science of education.

Walter B Kolesnik educational psychology is the study of those facts and principles of psychology which help to explain and improve the process of education.

1.2 Objectives

1.3 Nature & Scope of Educational Psychology

1.3.1 Nature of Educational Psychology

The nature of educational psychology is regarded as scientific because it is organized, systematic and universally accepted body wherein the facts remain constantly in search of truth through research and experimentation. It employs scientific methods in its study and its results are further subject to verification and modification.

The following points then confirm the nature of educational psychology as scientific subject of study.

1. *Laws of educational psychology are universal*

   Educational psychology possesses a well organized systematic and universally accepted body of facts supported by the relevant psychological laws and principles.

2. *Scientific method*

   Educational psychology employs scientific methods and adopts a scientific approach for studying the learners behavior such as observation, experimentation, clinical investigation, and generalization etc

3. *Constant search of the truth*

   The results of any study in educational psychology can be challenged and are modified in terms of the latest explanations and findings. So the findings of any study are never taken as absolute and permanent.

4. *Reliability*

   Educational psychology does not accept here say and nor take anything for granted. It emphasizes that essentially there is some definite causes linked with a behavior and the causes of this behavior are not related to supernatural phenomena.

5. *Positive science*

   Educational psychology is a positive science rather than a normative science.

6. *Applied behavioural science*

   Educational psychology is an applied behavioral science.

7. *Developing positive science*

   Educational psychology cannot claim the status of a developed positive science like other natural or applied sciences. It is considered as one of the developing positive science of the learners' behavior.

   W. A. Kelley 1941 listed the nature of educational psychology as follows:

a) To give a knowledge of the nature of the child

b) To give understanding of the nature aims and purposes of education

c) To give understanding of the scientific methods and procedures which have been used in arriving at the facts and principles of educational psychology

d) To present the principles and techniques of learning and teaching

e) To give training in methods of measuring abilities and achievements in school subjects

f) To give a knowledge of the growth and development of children

g) To assist in the better adjustment of children and to help them to prevent maladjustment

h) To study educational significance and control of emotions and

i) To give an understanding of the principles and techniques of correct training

Objectives of Educational Psychology

The general objectives of educational psychology include

a) To provide a body of facts and methods which can be used in solving teaching problems

b) To develop a scientific approach which can be used in problem solving attitude

c) To train in thinking psychologically about educational problems

Teaching objectives of educational psychology

d) To develop an understanding and appreciation of the dietary and environmental factors which underline learning.

e) To provide base for understanding the nature and principles of learning and to supply the techniques for its improvement

f) To understand and appreciate factors influencing individual's ability to learn

g) To provide understanding of the external factors like training, teaching aids library, classrooms etc. which are largely within the control of the teacher and the institution

h) To evaluate teaching efficiency

I) To develop an appreciation of the individual and importance of the individual with their individual differences.

www. Psychologydiscussion.net

1.3.2. Scope of Educational Psychology

The scope of educational psychology is securing greater and greater importance in the field of education.

The scope of educational psychology may be discussed under the following heads, the learner, the learning process, the learning situation, the learning experience, and the teacher.

- **The Learner**: The scope of educational Psychology is knitted around the learner. The topics include the innate abilities and capacities of the individual, individual differences and the measurement, the overt, covert, conscious, as well as unconscious behavior of the learner, the characteristics of his growth and development at each stage beginning from childhood to adulthood.
- **The Learning** Experiences Educational psychology helps in deciding what learning experiences is desirable at what stage of the growth and development of the learner; so that these experiences can be acquired with a greater ease and satisfaction
- **Learning Process** After knowing the learner and selecting the suitable and desirable learning experiences Educational Psychology moves on to the laws, principles, and theories of learning. Other items in the learning process are remembering and forgetting, perceiving, thinking, forming concepts, reasoning, problem solving, transfer of learning, ways and means of effective learning and so on.
- **Learning Situation and Environment** Here we deal with the environmental factors and learning situations which come midway between the learner and the teacher. Topics like classroom management, group dynamics, techniques and

aids that facilitate learning and evaluation, techniques and practices , guidance and counseling etc for the smooth functioning of the teaching learning process

- **The teacher** The teacher is a potent force, a source of knowledge and plays a vital role in teaching learning process. This is why the role of teacher is discussed under the scope of educational psychology. The personality pattern, adjustment technique, motivation, aspiration level, communication skill, interest, aptitude, etc fall under the discussion area of educational psychology.

  Besides, the stated items of educational psychology as mentioned above it may be further expanded by adding the following topics

  It studies the human behavior in educational situations. Psychology is the study of behavior. And education deals with the learning as well as modification of behavior, hence educational psychology pervades the entire field of education

Educational psychology discusses the growth and dev of an individual learner. How a child passes through the various stages of growth and what are the characteristics of each stage are in the study of educational psychology

Heredity and environment are found to contribute towards the growth and dev of an individual. How this knowledge can be made useful for bringing about the optimum development of the learner form a salient feature of scope of educational psychology.

Educational psychology deals with the nature and development of the personality of an individual. In fact education has been defined as the all round development of the personality of an individual, in fact personality development also implies a well adjusted personality of the learner.

Educational psychology studies the individual differences. Every individual differs from every other individual. It is one of the fundamental facts of human nature which have been brought to light by educational psychology. It has brought a revolutionary change in the concept and process of education.

Intelligence and its measurement are discussed under the scope of Educational psychology. This is an utmost important factor for all associated with educational performance.

Evaluation is another important field of educational psychology. It gives new techniques and tests for evaluation of personality, aptitude, interest, achievements and so on. It is educational statistics which help us in measurement and evaluation.

The teacher is supposed to guide and counsel the students at every step. It is only the knowledge of educational psychology which helps the teacher to understand in which direction the child is heading and necessary steps to be taken. Certain operations work well in groups than individually. Educational psychology recognizes these activities and therefore it is important for teacher to have knowledge of these facts to facilitate learning in students

Educational psychology deals with the latest techniques of experimentation and research. We can direct, control and predict the behavior of students on the basis of research studies in classroom teaching. The teacher can take up action research which he can easily carry for his personal satisfaction and immediate solution for his difficulties

1.4 Principles of Educational Psychology

According to APA (2015) the principles are organized into five areas of psychological functioning, cognition and learning, motivation, social and emotional dimensions context and learning dimension and assessment

1) Students beliefs or perception about intelligence and ability affect their cognitive functioning and learning
2) What students already know affects their learning
3) Students cognitive development and learning are not limited by general stages of development
4) Learning is based on context, so generalizing learning to new contexts is not spontaneous but instead needs to be facilitated
5) Acquiring long term knowledge and skill is largely dependent on practice
6) Clear explanatory and timely feed back to students is important for learning
7) Students self regulation assists learning and self regulatory skills can be taught
8) Students creativity can be fostered
9) Students tend to enjoy learning and perform better when they are more intrinsically than extrinsically motivated to achieve.
10) Students perceive in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals.

11) Teachers expectations about their students affect students' opportunities to learn their motivation and their learning outcomes.

12) Setting short term, specific and moderately challenging goals enhance motivation more than establishing long term, general and overtly challenging goals

13 Learning situates within multiple social contexts

14) Interpersonal relationships and communication are critical to both the teaching learning process and the social emotional development of students.

15) Emotional well being influences educational performance, learning and development

16) Expectation for classroom conduct and social interaction are learnt and can be taught using proven principles of behavior and classroom instructions

17) Effective classroom management is based on setting and communicating high expectations, consistently nurturing positive relationships and providing a high level of student support

18) Formative and summative assessments are both important and useful but require different approaches and interpretations

19) Students skills, knowledge and abilities are best measured with assessment processes grounded in psychological science with well defined standards for quality and fairness

20) Making sense of assessment data depends on clear, appropriate and fair interpretations

1.5. Methods of Educatonal Psychology

Psychology aims at systematic and scientific study of human behavior. It has its special tools and procedures. These tools and procedures help us in gathering and organizing data. These procedures are called its methods. These methods include Introspection, Observation, Experimental method Clinical method, Genetic or developmental method.

Introspection method is nothing but self observation. In **introspection**, the individual peeps into his own mental state and observes his own mental processes **Introspection method** is the oldest **method** It is the process of self-examination where one perceives,

analyses and reports one's own feelings to collect data about the conscious experiences of the subject.

1.5.1. Observation

It is one of the most popular of methods used in psychology for collection of data. This method is also called the method of objective observation. The individual's behavior is observed by somebody, other than that person himself. The behavior observed may be expressed in the form of bodily changes bodily actions gestures facial expression and speech.

The method is widely used by the child psychologists who would prepare records of all that the child did during a certain period and in a given situation. These observations enabled them to take certain generalizations about human behavior in general.

Observation can be broadly divided into two categories, namely, natural and participatory. In natural observation the observer observes the specific behavior or characteristic in natural setting. Here the subject is not aware of the fact that his or her behavior is being watched by someone. A teacher can observe his student within the classroom or in the play ground beyond the classroom without making the student aware . Natural observation can be done anywhere without any tool.

In participant observation the observer becomes the part of the group, which he wants to observe. Participant observation can be effective when a trained and practiced observer applies the technique.

Observation may be divided into two categories, crude more precisely natural observation without any tool and systematic observation with specified time, space, tool like checklist etc. Observational studies are quite important and produce significant results upon developmental characteristics of children. It also opens new areas of research in the field of educational psychology

Difficulties: Psychologists found that they could not keep pace with the speed of subject's behavior and thought as expressed by them. This objection has been solved to a large extent by introduction of devices like tape recorder, Dictaphone etc.

Another possible difficulty is the presence of psychologist in the situation and the subject may become conscious. He/ she may not behave naturally. . This introduced the use of one way screen and the system of observation booths. The subject would behave in the most natural manner without knowing that they are observed or studied.

Direct observation however can be however quite effective one the subject or subjects get used and adjusted to the presence of the psychologist.

In order to have reliable and correct observations there are some precautions that should be exercised.

First, the observer may adopt an objective attitude. Our observations should be free from our own biases, prejudices, and result from sustained attention

Second, it is necessary that before we form an estimate of an individual's behaviour should have made a number of observations of the same behavior in similar conditions

Third, if needed we should pool our observations wit those made by others

Fourth, the problem under study should be well defined and observers are trained to distinguish between what is observed and what is interpreted.

Fifth, In order to ensure the accuracy of observation and to reduce the effect of bias the behaviour may be observed for a specific period of time. After that it has been analyzed into its various aspects.

The device is called time sampling where the behavior is sampled for a short and definite period of time and it is regarded as representative of the behavior in general covered by the various analyzable elements together. For example, Iver James Robertson

Merits It is a natural and normal way to collect information from the sample under observation

This method is objective in nature and free from personal bias. Through this method we can observe as many children as we desire. This method is suitable for getting information from children and from special pupils who cannot give objective self report. It is less expensive method. It is economical both in case time and money

Demerits Observation is useful only for collecting data about overt behavior which is manifested in a number of activities. The overt behavior does not provide reliable information regarding the internal mental processes.

Subjectivity of observation as well as interpretation is another limitation of this method. The observer may interpret and present the data with subjective standpoint. It may distort the purpose of objective observation

Observation is subject to two types of errors, observer error, as stated above and sampling error. Sampling error may arise because of inappropriate selection of behavior or inadequate situation to be observed.

Such limitations may be avoided if sufficient precautions are taken, if collected data can be matched with data from other sources and if the observer is rigorously trained to undertake the job.

1.5.2. Experimental Method

Experimental method actually led the discipline Psychology to receive a scientific status. This method enables us to investigate, understand, control and predict the behavior of an individual. The experimental method uses a systematic procedure called experimental design. Experimental design provides important guidelines to the researcher to carry out his research systematically. The design is chalked out depending upon the nature of the topic under study. The layout of the design of the experimental method is as follows

Selecting a research topic

Formulating hypotheses

Selecting appropriate variables

Collecting data

Analyzing and interpreting data

Discussing and drawing conclusion

Experiments can be conducted in a laboratory, in the classroom, or anywhere else in the community Experimentation involves comparison between behavior of a control group, and that of an experimental group. Hypotheses have a rational base. Hypotheses emerge from a theoretical framework or preliminary experimentation.

The following are essential features of experimental method:

Psychological Laboratory

There should be psychology laboratory fully equipped with apparatus

Experimenter

There should be experimenter or experimenters who would conduct the experiment, administer as well as control the variable(s) and record the effects.

Subject

There is a subject or group of subjects on whom the experiment is done. The subjects are selected following the criteria of experiment.

Stimulus

Here the word stimulus denotes a variable or any physical force in the environment which leads the subject to behave or react

Variables

The term variable means that which can be varied or changed. If the stimulus is changed the response also changes. The former (stimulus) represents one type of variable; the later represents another type of variable. The first variable can be changed by the experimenter and is deliberately and is systematically varied to find out how the first one is accompanied by the changes in the second set of variables (response). Again the word variable can be mentioned as any event or process that may assume different values (James N. Shafer). A person's height, weight etc can be the examples of physical variables while intelligence, motivation etc can be considered as psychological variables.

There are mainly three types of variables, independent, organismic variables and response or dependent variables.

Independent variable is one which is systematically and independently manipulated by the experimenter. Independent variables in psychology can be classified into following groups- Environmental variables, instructional variables, task variables and subject variables

Perhaps the most popularly studied independent variables are environmental variables. Psychologists commonly select some aspect of the environment for example noise in the classroom. Noise is an environmental condition.

A second type of variable often studied by the psychologists is the kind of instructions given to the subjects. Depending on the instructions a subject may have a set to respond in different ways. Instructions may influence his response For example students doing mathematics who work under instructions to emphasize speed (rather than accuracy) may take short time than students who are not given such instructions.

Task Variables

The experimenter may be interested in knowing the effect of manipulating aspect of the task itself. Here, difficulty of the task, length of the task, pleasure associated with the task etc may serve as independent variable.

Subject Variable

Subject variables involve characteristics of the individuals such as age sex intelligence race and fatigue.

Organismic variables

Those variables have their origin within the organism,

Response variables

The dependent variable is such a variable, that we predict will change with the application of independent variable. In other words dependent variable or response variable is that variable on which the effect is being studied. For example we want to study the effect of study habit on academic performance of the learners. Here study habit is stimulus variable and academic performance is known as response variable.

Response variables can vary in the following ways- in terms of

Accuracy

Speed

It can be measured in terms of time limit, amount etc .Response variables can be measured in terms of following ways

Time limit

Amount limit

Probability of frequency

Strength or energy of response etc

Characteristics of experimental method

It enables one to study a particular behavior under controlled condition.

It is scientific in nature.

This method can be repeated without any difficulty

The results or conclusions arrived by this method are reliable.

Randomization in sampling or behavior is another important feature of experimental method.

Steps of Experimental method

Statement of the problem

Formulation of hypotheses

Designing the independent and dependent variables

Controlling the conditions of equipment

Selection of experimental design

Analyzing the obtained results

Verification confirmation of the hypotheses by the result of the experiment

Merits

This method is a most systematic procedure of solving problems. It provides reliable information

It is a revisable method.

Particularly experimental method makes psychology a scientific status.

It provides objective and precise information.

It offers the observer scientific approach to the mind of an individual.

It provides innovative ideas for further experimentation.

It enables us to control and direct human behavior

It is applicable in educational, individual and social problems.

Demerits

Experimental method demands for a laboratory situation. This situation is artificially arranged. Behavior is a natural phenomenon. Behavior may be changed in under artificial environment.

This method is time consuming and costly. Moreover, it requires specialized knowledge and skills.

Psychologists have criticized the fact that mostly the experiments have conducted on rats, cats and dogs. The investigation results are applied on human behavior

It sometimes interferes with the very thing that we are trying to experiment.

1.5.3. Correlational Method

Correlation method is nothing but a technique where the researcher measures two variables, understands and assesses the statistical relationship between them with no influence from any extraneous variable. It is non experimental in nature. Precisely,

correlation method is establishing a relationship between two variables. Simply these variables seem to interact with each other, so that when one variable is changing the change of the other variable can easily be detected. In this technique the researcher aims to find out whether the relationship between two variables positive, and negative or zero.

Both variables change in the same direction, as height and weight for an individual. It is positive correlation.

The variables change in opposite direction as mobility decreases as chronological age increases It is negative correlation.

There is no relationship between the changing aspects of two variables, it is zero correlation.

When to use

1. It is a type of descriptive research. There are two main situations where one intends to apply correlational research. When one tries to find out if there is a relationship between two variables but we don't expect to find a casual relationship between them.
2. When we think that there is a casual relationship between two variables but it is impractical or unethical to conduct experimental research that Manipulates one of the variables

1.5.4. Clinical Method

This method is primarily used to collect detailed information on the behavior problems of maladjusted and deviant cases. This method has been found to be widely used by Clinical Psychologists, Psychiatrists, Psychiatric Social workers and teachers in various places within classroom or beyond classroom. The main objective of this method is to study individual case or cases or group to detect and diagnose their specific problems and to suggest therapeutic measures to rehabilitate them in their environment.

It involves the following steps

Selecting specific purpose

Interview

Gathering the information

Formulating hypotheses

Interpreting the data and diagnosing

Planning for treatment of the situation

Correlation research may be operated by different methods, for example, testing hypotheses, analyzing quantitative data, by conducting surveys, by natural observation, by analyzing archival data and so on.

Merits

Correlation method is quick and flexible

It tries to eliminate subjective bias or influence from the researcher.

It allows access to large number of data to observe changes over time and space.

Demerits

Responses may not be always and accurate

Responses can be time consuming and unpredictable.

There is a chance for example from archival data that data may be unreliable or incomplete.

1.6. Application of Educational Psychology to Persons with Disabilities

Psychologists study the learners from several aspects. Like, social, emotional and cognitive processes involved in learning and apply their findings to improve the learning process. Some emphasize on developmental characteristics. Some emphasize specially on cognitive area. Some psychologists focus on childhood stages. Again some have interest on adolescence. Under this situation, Psychologists have a variety of scope to relate psychological principles in improving pupils' performance. For the CWSN the rules and principles of educational psychology can be applied for understanding the special needs of the learners.

Again Psychologists also put their interest and conduct investigations on teachers' characteristics, training component of the teachers, personal development of the teachers, mode of teaching, use of aids and appliances and so on. Educational psychology can be applied for selecting the criteria, desirable characteristics and selecting the training content for the teachers.

Curriculum and its transaction process play an effective role in the education of the learners. The important input for CWSN may be incorporated in curriculum. It can be processed too while transacting the curriculum. The activities for reaching learning objectives can be described in the curriculum. Thus the application of principles of

educational psychology can be reflected in curriculum construction as well as in the curriculum transaction for the CWSN.

Each student is unique and responds to different teaching methods. Educational psychology considers that students have different abilities and educational needs. In order to maximize each students' academic potential, schools must provide suitable and favorable classroom for the students. This is especially true in special education classrooms where students may struggle with physical or cognitive disabilities. Teachers with knowledge of psychology can present students with a variety of learning tools to minimize gaps created by disability.

Children with special needs respond differently to learning environments. Also they have several learning habits. Educational psychology can be applied in deciding effective learning environment. Further, educational psychology may investigate and provide suggestions for selecting effective learning habits of the CWSN.

The knowledge of educational psychology helps a teacher to create a positive learning environment and feeling of safety and confidence for the CWSN.

Connecting CWSN to resources that support a whole healthy child may be achieved following the guidelines of educational psychology.

Studying educational psychology is an opportunity to support a child's health and success in schools and beyond school. It is important for CWSN to learn how to function socially emotionally and behaviorally. Applying the rules of educational psychology that can be formulated.

Development of educational technologies supports CWSN to pursue their academic activities. Educational psychology explore the development of educational technology and provide beneficial inputs for the CWSN..

The real contributions of educational psychology are in a collaborative process to identify, diagnose and predict the presence of special feature among the learners at an early stage.

Using the inputs of educational psychology CWSN can be provided with better teaching learning environment (Sakir and Sharma 2017)

It can be stated from the above discussion that application of educational psychology for the children with special need cover a large area, viz, a) in case of early detection and identification of special features of the learners, b) in case of formulating effective teaching strategy for CWSN, c) in case of providing healthy learning environment, d) in case of developing suitable learning materials for them, e) in case of designing necessary equipments for their learning using educational technology, f) in case of

designing criterion based evaluation plan for the CWSN, g) in case of opening research areas for CWSN and so on.

(Sakir, Md. and Sharma, S International Journal of Education , June 2017, Vol 8, Aligarh)

1.7. Contemporary Trends

Educational Psychology is a developmental field and the importance of educational psychology is felt day by day in variety of areas. One of the ways educational psychology maintained its strength and validity is by adhering problems that have rational implications for teachers, students, school and education in general. These current topics include constructivism, Student diversity and out of school influences.

1.7.1. Constructivism

Students construct their own understanding of the world, Shuell (1996) stated that the learner does not merely read rather, he/ she constructs a unique mental representation of the material to be learned and task to be performed. The students select information, perceive to be relevant and interpret the information on the basis of their existing knowledge. Thus the learner adds information not especially, but selectively to his/ her previous knowledge. This is an active process where the learners make experiences meaningful.

According to Jean Piaget, each student constructs their own understanding, add meaning and create knowledge; this may be called individual constructivism.

On the other hand Vygotsky argued that individual in a social situation, for example, in the classroom, influenced by peers, in home by family and so on create meaning; this is called social constructivism.

Cognitive constructivism holds that people actively construct their own knowledge, and that reality is determined by the experiences of the owner (Johnson 1991). Theorists in this field today include Jerome Bruner, Harvard Gardner, Nelson Goodman and others.

In this line, two basic queries may be raised

What is knowledge? And

How is knowledge constructed?

Knowledge is our interpretation of the incidences happening around us. We do not know objective reality; rather, we construct our own reality or our own knowledge with personal experiences

No two people have the same experiences and this is why knowledge is subjective.

The knowledge of the two people can be taken as shared to the extent that their knowledge construction seems to be functional in the same way in given situation. Only they have common understanding expectation and behavior. They are compatible enough to allow it.

Knowledge is constructed through the adaptation of new events (Glesserfield 1996). It gives rise to conflict. When the conflict is solved reorganization of cognitive structure occurs knowledge is created.

A teacher can promote conflict, called discourse. The topic may be presented in the form of a conflict. The students may sit in a group and discuss exchanging opinions to reach to a solution.

Knowledge is constructed through the influence of environment. We use symbols. Materials etc present the immediate environment (Funston 1996). Environment includes each type, like physical, social, cultural, and economical and so on.

Readiness to learn has a different meaning for cognitive constructivism. Individuals are ready to learn about a concept when their cognitive constructivism is able to incorporate some aspect of the new concept.

No two students construct knowledge in the same way. As they have difference in social, cultural, precisely personal background. Even one can create so called mistaken idea. Still it is knowledge, which needs to be allowed in later stage. Vygotsky talked about zone of proximal development which can influence knowledge construction. Each student demands teachers' assistance to construct knowledge in a unique way and in a unique level depending upon their personal development.

Educational significance

Pose problems of encouraging relevance to students. Create cognitive conflict by presenting students with an interesting problem (Brooks and Brooks 1993)

Structure the learning experiences with primary examples. Teachers may structure teaching around big idea, important for the students and small ideas later. This is also called top down approach

Seek and value students' point of view. Constructivists want the teachers to listen carefully. Students' points are the windows to understand their reasoning, gateway of education.

Adapt curriculum to address students' understanding. Adapt curriculum to best fit of the students.

Assess students learning in the context of teaching. Try to follow how answers are derived. That is how they can.

1.7.2. Student Diversity in the classroom

Psychologists are generally interested in individual differences. Now the question is how institutions can accommodate differences in ability, race, ethnicity etc so that all students can get the opportunity to learn.

Developmental context provide rationale for difference, and readiness in diversity. Contexts include

The physical setting

The social influence

The personal characteristics

The influence of time

1.7.3. Out of School Experiences

A natural outgrowth of developmental context has drawn our attention to out of school influences that act diversely in students' learning. Steinbery (1996) studied 20,000 student in 9 high school and came out with difference in view point among Asian and non Asian students. The Asian students outperformed Whites, Blacks. and Latinos. They have difference in belief system. They clearly felt that poor academic performance would definitely and negatively affect their future. Parents have lasting effects upon school performance in three ways.

Parental attitude… Their parents deliberately or casually convey their views and attitudes toward school. Children are sensitive enough to interpret it. Accordingly whether school is important or not

Parental behavior

Through parents behavior children receive signal about the importance of the parents' place on schooling (e.g. ignoring notices, not attending parent- teacher meeting etc)

Parental Style

It encourages as well as discourages children's engagement in school

Besides the factors stated above some other factors also keep their influence upon students. Those factors include, parents, disciplinary technique, children's' behavior and attitude toward academic performance etc. NSOU A 2 SIM EDUCATIONAL PSYCHOLOGY

Check Your Progress….1

1. Primarily Psychology was a part of

a) Ethics

b) Logic

c) Philosophy

d) Sociology

2. The terms behind Psychology include

a) Psyche and logos

b) Psyche and logia

c) Philo and Sophia

d) None of the above

3. Psychology presently is defined as

a) Science of soul

b) Science of behavior

c) Science of consciousness

d) Science of mind

4. Educational psychology may be considered as

a) Applied positive science

b) Pure positive science

c) Educational Science

d) A branch of education

ANS. 1. c)/ 2. a)/ 3. b)/ 4. a)

Check your progress….2

Select the *true* and *false* statements

1. Observation method does not require any tool.
2. There is participant observation method.
3. Method of correlation always involves statistical operation
4. Clinical method is meant for the clinical cases only

ANS. 1 F/ 2T/ 3F/ 4F

List down the steps of experimental method

…….....

…….....

…….....

Check Your Progress…3

Select the *true* and *false* statements

1. Suitable educational devices may be organized from Educational Technology
2. Special pupils are given special materials for learning.
3. Teachers cannot alter curriculum transaction technique.
4. The inputs of educational psychology help the special learners within the classroom only.

ANS. 1 T/ 2F/ 3F/ 4F

Check Your Progress…4

Select the *true* and *false* statements

1. Student diversity means uniqueness of the students in the classroom
2. Out of school experiences can't influence a sincere learner.
3. Special students can't construct their own knowledge.
4. Constructivism can be individualistic as well as can be social

ANS. 1T/ 2F/ 3F/ 4t

1.8 Let us sum up

1.9 Unit End Exercise

1. Define Educational Psychology and mention its nature and scope
2. Briefly discuss the principles of educational Psychology
3. What are the methods of educational Psychology? Briefly describe any one method and write down the merits and demerits of this method
4. Compare between corelational method and clinical method.
5. Briefly discuss experimental method with its merits and demerits
6. Why the knowledge of educational psychology is essential for a teacher of special education?
7. What are the recent trends of Psychology? Write down the recent trends of psychology with your opinion.

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Unit - 2 □ Understanding The Development of The Learner

Structure

2.1. Introduction

The aim of education is to bring all round development in personality of a child. Educational psychology helps in realisation of this aim. The continuous interaction with the environment results in growth and development of the innate propensities, capacities, abilities, and potentialities of a child. The task of formal as well as informal education, therefore, is to provide nurturance in growth and development of the child. Hence, it is imperative that the teachers, supposed to be connected with the task of facilitating the child to grow and develop progressively, must be acquainted with the nature of growth and development. It is only with the knowledge of growth and development of the learner at each stage of his/ her life, that it is possible for the teachers to render proper guidance, arrange the learning situations, and plan the instructional programmes for bringing the desirable and harmonious development in personality of the children. This course exposes learners to the critical understanding of theoretical perspectives of development and implications for teaching learning process. Through close observation of children in their natural habitat would provide the theoretical understanding within realistic frames. This course would also be able to equip the teacher educators to reflect and interpret the physical, social, emotional, cognitive and moral development of the learner.

In this unit, we shall try to understand the process of growth and development in reference to their various aspects.

2.2 Objectives:

After completing the course, unit teacher educators will be able to:

- Discuss and understand the concept of growth and development.
- Explain the principles and their implication for growth and development.
- Know the various methods of studying development.
- Critically analyse the process from the point of view of cognitive development.
- Describe the factors affecting growth and development.

2.3: Concept of Growth and Development

Education aims at the all-round harmonious development of an individual. The development of a nation depends upon the development of its children, and there is no doubt that the childhood is the foundation upon which the development of an individual depends. Development of proper attitudes, habits and patterns of behaviour formed during the early years determine, to a great extent, how successfully an individual will adjust himself, as he grows older. It is, therefore, imperative that the teachers who are assigned with the responsibility of the development of the child should be acquainted with the meaning and characteristics of development.

Every child is unique. There are individual differences in children, which has a great bearing on their development. The needs of each individual child must be catered to for his optimum development. The United Nations International Children's Emergency Fund (UNICEF), an important organization of the United Nations, measures the development of a nation in terms of the benchmark of the development of its children. It is interested to note that this organisation gives a secondary importance to per capita income. In this aspect, under the auspices of UNICEF, an Italian Committee organized a workshop at Rome in 1990 for promoting the movement of child growth and development. The workshop prepared the Development Tree, which represents the rights of the children, which should be taken into consideration in the development and growth of children. The roots of the tree represent the right to social and economic development, and the branches represent the complementary rights (the right to information, to play, to live in peace, etc.). Therefore, it is observed that growth and development is not a matter of individual concern rather a global issue.

2.3.1 Definitions of Growth and Development

We often use 'growth' and 'development' interchangeably, as synonymous terms. In the strictest sense of the word, 'growth' is different from 'development'. In this strict

sense 'growth' means an increase in size, weight, dimension and complexity. When we say that a body or any of its parts has "grown", it means that it has become larger and heavier. Thus increase in size height, length and weight which can be measured, contributes 'growth'. Whereas by development means growing from an earlier stage to a later stage. So in the case of development there may be actually no increase in size or weight or dimension. There may even be a decrease in certain aspects. For example, in the case of glands like tonsils and other lymphatic glands, there may be actually a decrease in size as the child develops from an earlier stage to the later stage.

So growth means increase in size of not only the overall dimensions of the body in terms of height and weight, but also of the parts of the body such as head, arms, trunk, brain, the heart and muscles. Development, on the other hand, means the changes in the shape and functioning of the parts of the body and integration of various parts into functional unit as growth goes on. We can measure growth, but we can only observe development by nothing changes in shape as they occur and in mode of behavior as maturation is complete.

A. Angyal (1941) opined, "Development cannot be considered in terms of the mind alone but rather in terms of the individual as a whole in relationship with his experience with others. Thus, development is concerned with the biological total process taking place in the subject-object interrelation."

G. W. Allport (1948) thinks, "The developing individual cannot be thought of a thing in himself. Development, insofar as it is considered to be produced from within the individual himself alone, is only a convenient abstraction."

According to J. E. Anderson (1950), "Development does not consist merely of adding inches to one's height or improving one's ability. Instead, development is a complex process of integrating many structures and functions."

In the words of **E. B. Hurlock (1959),** the term "Development means a progressive series of changes that occur in an orderly predictable pattern as a result of maturation and experience".

Harold Stevenson (1968), a prominent development psychologist, has put the concept of development as, "Development, psychology is concerned with the study of changes in behaviour throughout the life span

Robert M. Liebert, R. W. Poulos and G. S. Marmor (1979) state, "Development refers to a process of change in growth and capability over time as function of both maturation and interaction with the environment." Thus, development includes: (i) Growth; (ii) Capability; (iii) Maturation; and (iv) Interaction with the environment.

To sum up, development is a series of orderly progression of change towards maturity. 'Orderly' refers to the arrangement of the changes. That is, each change at each stage is dependent upon what preceded it, and it affects what will come later. Development does not take place haphazardly. The term 'progressive' signifies that changes are leading forward and that the direction is towards adaptation is conducive to survival of the individual. Development has the four basic elements:

- ❖ Growth
- ❖ Maturation
- ❖ Experience
- ❖ Social Transmission (Learning through language, schooling or training by parents)

2.3.2. Comparison between Growth and Development

Development, growth and maturation are terms, which are commonly, used to convey the same meaning but there is a great difference.

Arnold Gessel (1929) wrote, "Growth is a function of the organism rather than that of environment as such. The environment furnishes the foil and the milieu for the manifestation of development, but these manifestations come from inner compulsion and are primarily organized by inherent inner mechanics and by an intrinsic physiology of development. The very plasticity of growth requires that there be limiting and regulatory mechanisms. Growth is a process so intricate and so sensitive that there must be powerful stabilising factors, intrinsic rather than extrinsic, which preserve the balance of the total pattern and direction of the growth trend. Maturation is, in a sense, a name for this regulatory mechanism."

L. D. Crow and A. Crow (1962) suggested that growth refers to structural and physiological changes, and development is concerned with growth as well as those changes in behaviour, which result from environment situations. Growth takes place when a child grows taller, his bones, muscles, and other parts of the body increase in size. Maturation is the unfolding of the characteristics with which the individual is endowed. As the child grows, his mind and body mature and he is able to function at a higher level. Development is a product of maturation and learning.

Growth does not always contribute to development. A child or adult may grow very fat and heavy, but such growth can hardly be considered development in the sense of advancement to a higher level of maturity. Actually, a person can be stated to have developed if he is physically healthier and/or has more sensory motor skills so that his physical condition is conductive to greater personal effectiveness. Thus, by improving

his sensory motor skills and thereby utilizing better the capacities he has received from about two decades of growth, a person can develop even after physical growth stops. Physical growth is quantitative in nature and is usually measured in inches and pounds or their equivalents.

2.3.3. Development, Growth and Maturation:

Growth	Development
The term growth is used purely in physical sense. It generally refers to an increase in size, length, height and weight. Changes in the quantitative aspects come into the domain of growth.	Development implies the overall changes in shape, form or structure resulting in improved working or functioning. It indicates the changes in the quality or character rather than in quantitative aspects
Growth is one of the parts of the developmental process. In a strict sense, development in its quantitative aspect is termed as growth.	Development is a wider and comprehensive term. It refers to the overall changes in the individual. Growth is one of its parts.
Growth describes the changes, which take place in the body and behaviour of an organism.	Development describes the changes in the organism as a whole and does not list the changes in parts.
Development describes the changes in the organism as a whole and does not list the changes in parts.	Development is a continuous process. It grows from womb to tomb. It does not end with the attainment of maturity. The changes, however small they may be, continue throughout the life span of an individual.
The changes produced by growth are the subject of measurement. They may be quantified.	Development, as stated earlier, implies improvement in the functioning and behaviour, and hence brings qualitative changes, which are difficult to be measured directly. They are assessed through keen observation in behavioural situations.
Growth may or may not bring development. A child may grow (in terms of weight) by becoming fat, but this growth may not bring any functional improvement (qualitative change) or development.	Development is also possible without growth as we see in the cases of some children that they do not gain in terms of height, weight or size, but they do experience functional improvement or development in physical, social, emotional or intellectual aspects.

Physical development is both qualitative and quantitative and implies increasing capacities and abilities, maturing functional improvement, and progress towards higher levels of potentiality and effectiveness. Growth can be 'measured', development can be observed by noting the changes in shape as they occur and the modes of behaviour as their maturation is completed.

2.3.4. Characteristics of Development

The following are the important characteristics of development:

- Childhood is the foundation period of development in the life of an individual.
- Development is the result of maturation and learning.
- Development follows a definite and predictable pattern.
- All individuals are different and their development takes different courses.
- Certain characteristics traits are associated with each phase of development.
- Each period of development involves difficulties.
- Traditional beliefs exist about individuals of different ages.
- There is development from generalized to more specific forms of response.
- Development further makes it possible for the child to differentiate among the movements.
- Development in the body structure as well as its functions, proceed from head to downward.
- Development also proceeds from the trunk towards the more distant parts.
- Development of behaviour is the result of growth and learning.
- Development is gradual and progressive. It takes time.
- Development follows a sequence. The child crawls before he creeps, stands before he walks babbles before he utters a word.
- There are interactions among different aspects of development.
- Development is not uniform in all individuals. So there is an individualistic trend.
- Development depends on both heredity and environment.

2.3.5. Stages of Development

Educators and psychologists have pointed at different ways of describing stages of development in the life span of an individual. A brief account of these stages is given here to show how children behave differently at successive stages. This outline indicates how children learn new and more complex tasks, as they grow older.

I) Jean Jacques Rousseau's (1712-1778) Views on Stages of Development: The earliest effort at marking out the stages of development was made by Rousseau. He attempted to divide the individual's development into four stages as given:

	Stage	**Period and Approximate Age**	**Characteristics**
I)	Infancy	1 to 5 years	1) Free wandering stage 2) Simple play things 3) Physical development
II)	Childhood	Between 5 to 12 years	1) Development of senses 2) No verbal lessons 3) Activity and experience
III)	Pre Adolescence 12 to 15 years	12 to 15 years	1) Period of developing intellect 2) Study of natural sciences 3) Manual work and industrial
IV)	Adolescence	15 to 20 years	1) Sex instruction. 2) Moral education through activities and occupation. 3) Understanding of complex Social relationship.

II. E. H. Erickson's eight Stages of Psycho-Social Development:

According to Erickson, development is the result of the interaction between the individual's biological needs and the social forces encountered in everyday life and its application over the entire life span. See the order as delineated here under:

Psycho- Social Stage	Tasks or Crisis	Social Condition	Social -Psycho Outcomes
Stage I: Oral Sensory (Birth to 1 year)	Can I trust the world?	Support and provision of Basic needs. Lack of support and deprivation.	Basic trust Basic mistrust
Stage II: Muscular Anal (2-3years)	Can I control my own behaviour?	Permissiveness and support. Over protection lack of support.	Autonomy Shame and doubt
Stage III: Loco motor (4-5 genital years)	Can I become independent of my parents by exploring My limits?	Encouragement to explore. Lack of Opportunity to explore.	Initiative. Guilt.
Stage IV: Latency (6-11 years)	Can I master the necessary skills to adapt?	Adequate training and encouragement. Poor Training and lack of support.	Industry. Inferiority.
Stage V: Puberty and (12-18 adolescence years)	Who am I? What are my beliefs and attitudes?	Internal stability and feedback, which is positive. Confusion of feedback and unclear feedback.	Personal Identity. Role confusion.
Stage VI: Young Adulthood	Can I give full of myself to Another?	Warmth and sharing. Loneliness.	Intimacy. Isolation.
Stage VII: Adulthood	What can I offer to succeeding generations?	Purpose-fullness and productivity. Lack of growth and repression.	Generativity. Stagnation.
Stage VIII: Maturity	Have I found contentment and satisfaction through my life's work and play?	Unity and fulfillment. Disgust and dissatisfaction.	Integrity. Despair.

III. Jean Piaget's (1896-1980) Development Stages: Piaget, a Swiss educator, observed children for about 50 years and wrote more than 20 books on the various aspects of development. He pointed out four stages of development as shown below.

Stage	Age/Periods	Characteristics
1) Sensory motor stage	Birth to 2 years	Manipulation of objects in the environment.
2) Pre-Operational stage	Between 2 to 6 years	Child begins to acquire vocabulary.
3) Concrete Operational stage	Between age of 6 and 11 or 12	Child learns to add, substract, multiply and divide.
4) Formal Operational stage	Between 11 or 12 to 14 or 15	The child begins to think logically.

Summing up: If we include the pre-birth period also, the life span or stages of development of human organism can be divided conveniently into the following stages.

S. No.	Name of the Stage	Period and Approximate Age
1)	Pre-natal (pre-birth) stage	From conception to birth.
2)	Infant Stage	From birth to 3 years of age.
3)	Childhood Stage:	From 4 to 12 years of age or to the onset of puberty.
	i) Pre-Childhood Stage	From 4 to 6 years of age.
	ii) Early Childhood Stage	From 7 to 9 years of age.
	iii) Later Childhood Stage	From 10 to 12 years of age.
4)	Adolescence	From the onset of puberty to the age of maturity– Generally 13 to 19 years of age.
5)	Adulthood	From 20 years of age or age of maturity until the age of productivity.
6)	Old age	From the end of the productivity till death.

It is observed that there is no rigidity in the above classification in terms of either the division of life span into stages or the duration of the period mentioned against each stage. There are great individual differences, and it should not presume that every child would necessarily have each stage according to the period indicative above. These are general generalizations drawn. Nevertheless, these generalizations indicate broad outlines of the course to be followed in the development of human organisms.

2.3.6. Principles of Growth and Development

From the scientific knowledge gathered through observing children, some principles have emerged. These principles enable the parents and the teachers to understand how children develop, what is expected of them, how to guide them and provide proper environment for their optimum development and so on.

Principle of Continuous Development:

First of all, development is a continuous process. Development follows continuity. It goes from womb to tomb and never ceases. An individual starting his life from a tiny cell develops his body, mind, and other aspects of his personality through a continuous stream of development in various dimensions.

Rate of Growth and Development is not uniform:

Although development follows continuity, yet the rate of growth and development is not steady and uniform at all times. It proceeds more rapidly in the early years of life but slows down into later years of infancy. Again, at the dawn of puberty, there is a sudden rise in the speed of growth and development, but it is not maintained for long. Therefore, at no stage, the rate of growth and development show steadiness. It rather takes place by fits and starts.

Principle of Individual Difference:

According to this principle, there exists wide individual differences among the children with respect to their growth and development in various dimensions. Each child grows at his own unique rate.

Uniformity of Pattern:

Although development does not proceed at a uniform rate and shows marked individual differences, yet it follows a definite sequence or pattern somewhat uniform in the off springs of a species. For example, all off springs of human beings begin to grow from head downwards. Similarly, the motor development and language development in all children seems to follow a definite sequence.

Development Proceeds from General to Specific Responses:

In all phases of child's development, the general activity precedes specific activity. His responses are of a general sort before they become specific. For example, the boy waves his arms in general which is a random movement before he is capable of so specific a response as reaching. Similarly, when a newborn infant cries, the whole of the body is involved. With growth, crying is limited to the vocal cords, eyes etc. In language development, the child learns general words before specific. He uses the word daddy in greeting many men, and it is only afterwards that he uses it for his father.

Principle of Integration:

Where it is true that development proceeds from general to specific or from whole to parts, it is also seen that specific responses or part movements are combined in the later process of learning or development. "Development" as Kuppusuwamy observes, "thus involves a movement from the whole to the parts and from the parts to the whole." It is the integration of whole and its parts as well as of the specific and general responses that make a child developed satisfactorily in the various dimensions of his growth and development.

Principle of Interrelation: The growth and development in various dimensions like physical, mental, social etc. are interrelated and interdependent. Growth and development in any one dimension affects the growth and development of the child in other dimensions. For example, children with the above-average intelligence are generally found to possess above-average physical and social development. The asset of growth in one dimension diminishes the bright possibility in other dimensions. That is why, the child having poor physical development tend to regress in emotional, social and intellectual development.

Development is Predictable: With the help of the rate of growth and development of a child, it is possible for us to predict the range within which his mature development is going to fall. For example, X-rays of the bones of the wrist of a child will tell approximately, what his ultimate size will be. Similarly, the knowledge of the present mental ability of a child will help in predicting his ultimate mental development.

Principle of Interaction of Heredity and Environment:

The individual is the product of interaction between his heredity and environment. However, genes are important in determining the rate and quality of his growth and development, his social and cultural environment, physical surroundings and the emotional climates will have their own impact.

Principle of Interaction of Maturation and Learning:

Growth and development are resultant of both maturation and learning. Maturation refers to change in the development of organism due to the unfolding and ripening of abilities, characteristics, traits and potentialities present at birth. Learning denotes the changes in behaviour due to training and/or experience. Maturation and learning are interacting.

2.3.7. Educational Implications of the Principles of Growth and Development

The above-mentioned principles of growth and development carry wide educational meaning for the children, parents and the teachers. It can be explained in the following ways: Knowledge of the principles of growth and development tells us that there are wide individual differences among the children with respect to their rate of growth and development. Therefore, we must pay attention to their individual pattern and growth rate while planning the course for their education and development.

Its knowledge helps us to know what to expect and when to expect from an individual child with respect to his physical, mental, social development etc. at different stages of development. The correct knowledge of the growth trend of a child helps the parents and teachers not to under or over-estimate the future competency or expectancy of their child.

It helps us to know the direction as well as the general pattern of development. It guides us to locate the degree of abnormality in our children and students and to take like-wise remedial steps. The knowledge that development starts from whole to parts, and then from parts to whole, helps us to plan the learning process and set the learning methods accordingly.

Principles of inter-relation and interdependence of the various aspects of growth and development help us to aim for the harmonious growth and development of the personality of the child, and warn us not to develop a particular aspect at the cost of one or the other.

The knowledge of the uniformity of pattern with respect to growth and development makes it possible for the parents and teachers to plan ahead of time for the changes that will take place in their children. Children will also get benefitted if they can be acquainted with these changes before hand.

The knowledge that heredity and environment both play a conjoined role in the process of growth and development helps us to pay sufficient attention over the environmental conditions in child rearing.

In this way, the knowledge of the principles of growth and development helps much in the well-being of the youngsters.

2.4: Methods of Studying Development

Study design depends greatly on the nature of the research question. In other words, knowing what kind of information the study should collect is a first step in determining

how the study will be carried out (also known as the methodology). Let's say we want to investigate the relationship between daily walking and cholesterol levels in the body. One of the first things we'd have to determine is the type of study that will tell us the most about that relationship. Do we want to compare cholesterol levels among different populations of walkers and non-walkers at the same point in time? Or, do we want to measure cholesterol levels in a single population of daily walkers over an extended period of time? The first approach is typical of a cross-sectional study. The second requires a longitudinal study. To make our choice, we need to know more about the benefits and purpose of each study type.

2.4.1. Longitudinal Study

A longitudinal study, like a cross-sectional one, is observational. So, once again, researchers do not interfere with their subjects. However, in a longitudinal study, researchers conduct several observations of the same subjects over a period of time, sometimes lasting many years.

The benefit of a longitudinal study is that researchers are able to detect developments or changes in the characteristics of the target population at both the group and the individual level. The key here is that longitudinal studies extend beyond a single moment in time. As a result, they can establish sequences of events.

To return to our example, we might choose to look at the change in cholesterol levels among women over 40 who walk daily for a period of 20 years. The longitudinal study design would account for cholesterol levels at the onset of a walking regime and as the walking behavior continued over time. Therefore, a longitudinal study is more likely to suggest cause-and-effect relationships than a cross-sectional study by virtue of its scope.

In general, the research should drive the design. But sometimes, the progression of the research helps determine which design is most appropriate. Cross-sectional studies can be done more quickly than longitudinal studies. That's why researchers might start with a cross-sectional study to first establish whether there are links or associations between certain variables. Then they would set up a longitudinal study to study cause and effect.

Longitudinal Research Designs

Longitudinal research designs tracks groups of participants over a period of time with two or more assessments of the same individuals at different times. These designs can last any amount of time. Short-term designs tend to be used for infants. Most

longitudinal designs are conducted over longer periods of times, often for several months, years, or even decades.

Advantages of Longitudinal Research Designs

One advantage is that longitudinal designs can help researchers understand how processes change in individuals. Another advantage is that these designs generate a lot of data and can allow researchers to explore a wide variety of research questions.

Disadvantages of Longitudinal Research Designs

The main challenge of using a longitudinal design is the cost in time and resources. These studies are much more expensive and take much longer to conduct than a cross-sectional study with the same number of participants. A second issue is the impact of repeated testing. Much like a within-subjects design, researchers need to assess participants several times in a longitudinal study and this might influence participants. The third limitation of longitudinal research is that it faces subject attrition. Subject attrition poses two issues:

1. It might lead to insufficient number of participants at the end of the study, which may mean not having enough statistical power.

2. It may result in significant changes to the study over the course of multiple assessments in terms of biases in who drops out. There are methods of minimizing attrition such as providing incentives, although these issues related to participant retention are ones that local IRBs will want to know about.

A fourth disadvantage of longitudinal studies is maintaining research personnel over time. In cases where studies last many years, staff might need to be changed and it is critical that the protocol is kept consistent.

A fifth disadvantage is determining whether the outcomes observed are due to developmental processes or to the timing of data collection that impacted all the participants.

Finally, the quality of a longitudinal study depends greatly on the initial sample and the quality of the measures in the earliest assessments. While these are factors critical to all studies, researchers using a longitudinal design have a much more difficult time recruiting a new sample in the middle of their study.

2.4.2. Cross-sectional Study

Both the cross-sectional and the longitudinal studies are observational studies. This means that researchers record information about their subjects without manipulating

the study environment. In our study, we would simply measure the cholesterol levels of daily walkers and non-walkers along with any other characteristics that might be of interest to us. We would not influence non-walkers to take up that activity, or advise daily walkers to modify their behavior. In short, we'd try not to interfere. The defining feature of a cross-sectional study is that it can compare different population groups at a single point in time. Think of it in terms of taking a snapshot. Findings are drawn from whatever fits into the frame.

To return to our example, we might choose to measure cholesterol levels in daily walkers across two age groups, over 40 and under 40, and compare these to cholesterol levels among non-walkers in the same age groups. We might even create subgroups for gender. However, we would not consider past or future cholesterol levels, for these would fall outside the frame. We would look only at cholesterol levels at one point in time.

The benefit of a cross-sectional study design is that it allows researchers to compare many different variables at the same time. We could, for example, look at age, gender, income and educational level in relation to walking and cholesterol levels, with little or no additional cost.

However, cross-sectional studies may not provide definite information about cause-and-effect relationships. This is because such studies offer a snapshot of a single moment in time; they do not consider what happens before or after the snapshot is taken. Therefore, we can't know for sure if our daily walkers had low cholesterol levels before taking up their exercise regimes, or if the behavior of daily walking helped to reduce cholesterol levels that previously were high.

Cross-sectional Designs

Cross-sectional research designs are the most common types of studies across age and time. They involve simultaneously assessing two or more different age groups. One challenge is determining the spacing between ages (how wide the gap in days, weeks, months, or even years) and results from past research, theoretical arguments, and your research question should all inform that decision.

Advantages of Cross-Sectional Designs

A main advantage of a cross-sectional design is that it allows researchers to gather information about different age groups in a short period of time. They also offer great ways to discover and document age-related differences associated with certain behaviors.

Disadvantages of Cross-Sectional Designs

Cross-sectional designs do not identify the underlying causes of differences across age groups. Researchers cannot tell whether age, maturation, specific learning experiences, or a combination of the above are the root of the difference. It is also possible that a cohort effect, the result of experiences that impact an entire group of individuals, is at play.

A second limitation of a cross-sectional design is verifying that methods are equally good at measuring behaviors for different age groups in the sample, which is known as having equivalent measures.

Lastly, cross-sectional designs tend to underestimate variability within an age group in order to characterize differences between groups. Because the focus is on differences between ages, it is possible that achievements obtained at specific ages gain greater status than they deserve.

2.4.3. Cohort Studies

These are the best method for determining the incidence and natural history of a condition. The studies may be prospective or retrospective and sometimes two cohorts are compared.

Prospective Cohort Studies

A group of people is chosen who do not have the outcome of interest (for example, myocardial infarction). The investigator then measures a variety of variables that might be relevant to the development of the condition. Over a period of time the people in the sample are observed to see whether they develop the outcome of interest (that is, myocardial infarction). In single cohort studies those people who do not develop the outcome of interest are used as internal controls. Where two cohorts are used, one group has been exposed to or treated with the agent of interest and the other has not, thereby acting as an external control.

Retrospective Cohort Studies

These use data already collected for other purposes. The methodology is the same but the study is performed potshot. The cohort is “followed up” retrospectively. The study period may be many years but the time to complete the study is only as long as it takes to collate and analyze the data.

Advantages and disadvantages

The use of cohorts is often mandatory as a randomized controlled trial may be unethical; for example, you cannot deliberately expose people to cigarette smoke or asbestos. Thus research on risk factors relies heavily on cohort studies.

As cohort studies measure potential causes before the outcome has occured the study can demonstrate that these "causes" preceded the outcome, thereby avoiding the debate as to which is cause and which is effect.

A further advantage is that a single study can examine various outcome variables. For example, cohort studies of smokers can simultaneously look at deaths from lung, cardiovascular, and cerebrovascular disease. This contrasts with case-control studies as they assess only one outcome variable (that is, whatever outcome the cases have entered the study with).

Cohorts permit calculation of the effect of each variable on the probability of developing the outcome of interest (relative risk). However, where a certain outcome is rare then a prospective cohort study is inefficient. For example, studying 100 A&E attendees with minor injuries for the outcome of diabetes mellitus will probably produce only one patient with the outcome of interest. The efficiency of a prospective cohort study increases as the incidence of any particular outcome increases. Thus a study of patients with a diagnosis of deliberate self harm in the 12 months after initial presentation would be efficiently studied using a cohort design.

Another problem with prospective cohort studies is the loss of some subjects to follow up. This can significantly affect the outcome. Taking incidence analysis as an example (incidence = cases/per period of time), it can be seen that the loss of a few cases will seriously affect the numerator and hence the calculated incidence. The rarer the condition the more significant this effect.

Retrospective studies are much cheaper as the data have already been collected. One advantage of such a study design is the lack of bias because the outcome of current interest was not the original reason for the data to be collected. However, because the cohort was originally constructed for another purpose it is unlikely that all the relevant information will have been rigorously collected.

Retrospective cohorts also suffer the disadvantage that people with the outcome of interest are more likely to remember certain antecedents, or exaggerate or minimize what they now consider to be risk factors (recall bias).

Where two cohorts are compared one will have been exposed to the agent of interest and one will not. The major disadvantage is the inability to control for all other factors that might differ between the two groups. These factors are known as confounding variables.

A confounding variable is independently associated with both the variable of interest and the outcome of interest. For example, lung cancer (outcome) is less common in

people with asthma (variable). However, it is unlikely that asthma in itself confers any protection against lung cancer. It is more probable that the incidence of lung cancer is lower in people with asthma because fewer asthmatics smoke cigarettes (confounding variable). There are a virtually infinite number of potential confounding variables that, however unlikely, could just explain the result. In the past this has been used to suggest that there is a genetic influence that makes people want to smoke and also predisposes them to cancer.

The only way to eliminate all possibility of a confounding variable is via a prospective randomized controlled study. In this type of study each type of exposure is assigned by chance and so confounding variables should be present in equal numbers in both groups.

Finally, problems can arise as a result of bias. Bias can occur in any research and reflects the potential that the sample studied is not representative of the population it was drawn from and/or the population at large. A classic example is using employed people, as employment is itself associated with generally better health than unemployed people. Similarly people who respond to questionnaires tend to be fitter and more motivated than those who do not. People attending A&E departments should not be presumed to be representative of the population at large.

How to run a cohort study

If the data are readily available then a retrospective design is the quickest method. If high quality, reliable data are not available a prospective study will be required.

The first step is the definition of the sample group. Each subject must have the potential to develop the outcome of interest (that is, circumcised men should not be included in a cohort designed to study paraphimosis). Furthermore, the sample population must be representative of the general population if the study is primarily looking at the incidence and natural history of the condition (descriptive).

If however the aim is to analyze the relation between predictor variables and outcomes (analytical) then the sample should contain as many patients likely to develop the outcome as possible, otherwise much time and expense will be spent collecting information of little value.

2.5: Human Development

Can you recall events from your early childhood say the second or third year? You might have a few vague and blurred memories about your childhood. The experiences

of that period form the basis of the type of person you are today. How human beings grow, change and adjust themselves to their environment is the focus of development and behavior as also the concepts, principles and theories of growth of development. The human being is never static. From conception to death, he undergoes changes. There are progressive changes in response to environmental conditions. His body organs and psychological functions show the curves of capacity and achievement as well as slow erosion and decay. Cognitive abilities develop and then degenerate; basic metabolism reaches a peak, then declines, the endocrine function flourishes, and then fades. There is a rise and fall of physical energy in terms of both the force and speed of action with age. In fact, no organ or function of human beings has yet been found which is independent of age determinants. At the time of conception, a child has genetic potentialities that are partly predictable and partly unpredictable.

2.5.1. Physical Development

Physical development is divided into two areas, growth and development. Growth is the physical changes of, the increase in size, height and weight. Development is how children gain control over their physical actions to do complicated and difficult activities more skill fully and easily. Growth and development are linked because the development and improvement of physical skills depends on the size of the child and their muscular strength. Physical development will usually follow a sequence even though the age may vary.

Infancy

- Head and chest circumference are nearly equal to the part of the abdomen.
- Head circumference increases approximately 2 cm (0.79 in) per month until two months, then increases 1.5 cm (0.59 in) per month until four months.
- Increases are an important indication of continued brain growth.
- Continues to breathe using abdominal muscles.
- Skin remains sensitive and easily irritated.
- Legs may appear slightly bowed.
- Cries with tears.
- Gums are red.
- Eyes begin moving together in unison.
- Responds to and thrives on warm, sensitive physical contact and care.

- Expresses discomfort, hunger or thirst.
- Has very poor vision. The infant has trouble focusing on objects and could barely make out images with its eyes.

Childhood

- Head and chest circumferences are basically equal.
- Head circumference increases approximately 1 cm (0.39 in) per month until six to seven months, then 0.5 cm (0.20 in) per month; head circumference should continue to increase steadily, indicating healthy, ongoing brain growth.
- Posterior fontanelle closing or fully closed.
- Anterior fontanelle.
- Breathing is abdominal; respiration rate depending on activity; rate and patterns vary from infant to infant.
- Very active
- Teeth may begin to appear, with upper and lower coming in first. Gums may become red and swollen, accompanied by increased drooling, chewing, biting, and mouthing of objects.
- Legs may appear bowing gradually disappears as infant grows older.
- Fat rolls ("baby fat") appear on thighs, upper arms, and neck.
- True eye colour is established.

Early Childhood

- Respiration rates vary with activity
- Environmental conditions, weather, activity, and clothing still affect variations in body temperature.
- Head and chest circumference remain equal.
- Anterior fontanelle begins to close.
- Continues to use abdominal muscles for breathing.
- More teeth appear, often in the order of two lower incisors then two upper incisors followed by four more incisors and two lower molars but some babies may still be waiting for their first.

- Arm and hands are more developed than feet and legs (cephalocaudal development); hands appear large in proportion to other body parts.
- Legs may continue to appear bowed.
- "Baby fat" continues to appear on thighs, upper arms and neck.
- Feet appear flat as arch has not yet fully developed.
- Both eyes work in unison (true binocular coordination).
- Can see distant objects (4 to 6 m or 13 to 20 ft away) and points at them.

Late Childhood

- Weight is now approximately 3 times the child's birth weight.
- Respiration rate varies with emotional state and activity.
- Rate of growth slows.
- Head size increases slowly; grows approximately 1.3 cm (0.51 in) every six months; anterior fontanelle is nearly closed at eighteen months as bones of the skull thicken.
- Anterior fontanelle closing or fully closed, usually at the middle of this year.
- Chest circumference is larger than head circumference.
- Legs may still appear bowed.
- Toddler will begin to lose the "baby fat" once he/she begins walking.
- Body shape changes; takes on more adult-like appearance; still appears top-heavy; abdomen protrudes, back is swayed.

Adolescence

- Posture is more erect; abdomen still large and protruding, back swayed, because abdominal muscles are not yet fully developed.
- Respirations are slow and regular
- Body temperature continues to fluctuate with activity, emotional state, and environment.
- Brain reaches about 80 percent of its adult size.
- 16 baby teeth almost finished growing out

Adulthood

- Growth is steady though slower than in first two years.
- Adult height can be predicted from measurements of height at three years of age; males are approximately 53% of their adult height and females, 57%.
- Legs grow faster than arms.
- Circumference of head and chest is equal; head size is in better proportion to the body.
- "Baby fat" disappears as neck appears.
- Posture is more erect; abdomen no longer protrudes.
- Slightly Knock-kneed.
- Can jump from low step.
- Can stand up and walk around on tiptoes
- "Baby" teeth stage over.
- Needs to consume approximately 6,300 kJ (1,500 kcal) daily.
- Head circumference is usually not measured after age three.
- Requires approximately 7,100 kJ (1,700 kcal) daily.
- Hearing acuity can be assessed by child's correct usage of sounds and language, and also by the child's appropriate responses to questions and instructions.
- Head size is approximately that of an adult's.
- May begin to lose "baby" (deciduous) teeth.
- Body is adult-like in proportion.
- Requires approximately 7,500 kJ (1,800 kcal) daily
- Visual tracking and binocular vision are well developed.
- Weight gains reflect significant increases in muscle mass.
- Heart rate and respiratory rates are close to adults.
- Body may appear lanky as through period of rapid growth.
- Baby teeth beginning to be replaced by permanent ones, starting with the two lower front teeth

- 20/20 eyesight; if below 20/40 should see a professional.
- The most common vision problem during middle childhood is myopia, or nearsightedness.
- Uses 6,700 to 7,100 kJ (1,600 to 1,700 kcal) a day.
- Boys may begin growth of fine facial hair
- Generally pleasant, sunny disposition
- May show sexual attraction to/interest in peers.
- Often a high interest in extracurricular activities
- May want to please and be popular
- Has a large circle of both-gender friends
- May show signs of depression.

2.5.2. Social Development

Infancy

- Less wary of strangers.
- Helps pick up and put away toys.
- Plays alone.
- Enjoys being held and read to.
- Often imitates adult actions in play.
- Enjoys adult attention; likes to know that an adult is near; gives hugs and kisses.
- Recognizes self in mirror.
- Enjoys the companionship of other children, but does not play cooperatively.
- Begins to assert independence; often refuses to cooperate with daily routines that once were enjoyable; resists getting dressed, putting on shoes, eating, taking a bath; wants to try doing things without help.
- May have a tantrum when things go wrong or if overly tired or frustrated.
- Exceedingly curious about people and surroundings; needs to be watched carefully to prevent them from getting into unsafe situations.

- Shows signs of empathy and caring: comforts another child if hurt or frightened; appears to sometimes be overly affectionate in offering hugs and kisses to children
- Continues to use physical aggression if frustrated or angry (for some children, this is more exaggerated than for others); Physical aggression usually lessens as verbal skills improve.
- Temper tantrums likely to peak during this year; extremely difficult to reason with during a tantrum.
- Impatient; finds it difficult to wait or take turns.
- Enjoys "helping" with household chores; imitates everyday activities: may try to toilet train a stuffed animal, feed a doll.
- "Bossy" with parents and caregivers; orders them around, makes demands, expects immediate compliance from adults.
- Watches and imitates the play of other children, but seldom interacts directly; plays near others, often choosing similar toys and activities),
- Offers toys to other children, but is usually possessive of playthings; still tends to hoard toys.
- Making choices is difficult; wants it both ways.
- Often defiant; shouting "no" becomes automatic.
- Ritualistic; wants everything "just so"; routines carried out exactly as before; belongings placed "where they belong."

Childhood

- Outgoing; friendly; overly enthusiastic at times.
- Moods change rapidly and unpredictably; laughing one minute, crying the next; may throw tantrum over minor frustrations (a block structure that will not balance); sulk over being left out.
- Imaginary playmates or companions are common; holds conversations and shares strong emotions with this invisible friend. .
- Boasts exaggerates, and "bends" the truth with made-up stories or claims of boldness; tests the limits with "bathroom" talk.
- Cooperates with others; participates in group activities.

- Shows pride in accomplishments; seeks frequent adult approval.
- Often appears selfish; not always able to take turns or to understand taking turns under some conditions; tattles on other children.
- Insists on trying to do things independently, but may get so frustrated as to verge on tantrums when problems arise: paint that drips, paper airplane that will not fold right.
- Enjoys role-playing and make-believe activities.
- Relies (most of the time) on verbal rather than physical aggression; may yell angrily rather than hit to make a point; threatens: "You can't come to my birthday party."
- Name-calling and taunting are often used as ways of excluding other children.
- Can be bossy at times, telling their parents to stop talking, or telling their friends to "Come here right now."
- Establishes close relationships with playmates; beginning to have "best" friends.
- Begins to ask questions about own and others' bodies.
- May attempt to see others naked in the bathroom.
- May begin to explore and touch genitalia.

Adolescence

- Enjoys and often has one or two focus friendships.
- Plays cooperatively (can lapse), is generous, takes turns, shares toys.
- Participates in group play and shared activities with other children; suggests imaginative and elaborate play ideas.
- Shows affection and caring towards others especially those "below" them or in pain
- Generally subservient to parent or caregiver requests.
- Needs comfort and reassurance from adults but is less open to comfort.
- Has better self-control over swings of emotions.
- Likes entertaining people and making them laugh.
- Enjoys conversing with other people.

- Boasts about accomplishments.
- Often has an imaginary friend.

Adulthood

- Uses language rather than tantrums or physical aggression to express displeasure: "That's mine! Give it back, you dummy."
- Talks self through steps required in simple problem-solving situations (though the "logic" may be unclear to adults).
- Has mood swings towards primary caregiver depending on the day
- Friendship with parent is less depended on but still needs closeness and nurturing.
- Anxious to please; needs and seeks adult approval, reassurance, and praise; may complain excessively about minor hurts to gain more attention.
- Often can't view the world from another's point of view
- Self-perceived failure can make the child easily disappointed and frustrated.
- Can't handle things not going their own way
- Does not understand ethical behaviour or moral standards especially when doing things that have not been given rules
- Understands when he or she has been thought to be "bad"; values are based on others' enforced values.
- May be increasingly fearful of the unknown like things in the dark, noises, and animals.
- Mimic dating behaviour, such as kissing or holding hands.
- Purposefully touch own genitalia.
- Highly self-critical and eager to please
- Can understand right and wrong
- Increased ability at problem solving and reasoning
- Can feel shame and guilt
- Complains a lot and has strong emotional swings
- Occasionally has meltdowns over minor frustrations, mainly for attention
- Ability to deal with mistakes and failure improves

- Beginning of sexual attraction to/interest in peers.
- Explore genitalia with other children their age. This occurrence typically begins with children "playing doctor" or who say "show me yours and I'll show mine." The event is the child showing interest in "naughty parts" which is perceived as forbidden.
- Reluctant to undress in front of others and wish to have more privacy from parents.
- Starts to develop a close circle of same-gender friends
- Becomes more susceptible to peer pressure
- Enjoys group activities
- Prone to mood swing and melodramatics
- Extremely impatient and may have a hard time waiting for special events, such as Christmas
- Often displays an intense revulsion of the opposite gender
- Will use physical complaints as a means of getting out of undesired tasks
- Generally dependable and can be trusted with basic responsibilities
- Prone to wide mood swings
- Some sexual attraction to/interest in peers.
- Not as moody as 7- to 9-year-olds; overall disposition tends to be cheerful and fun-oriented
- Friendships are highly important, with friends usually of the same-sex. This is not consistent to every individual, nor important overall
- Can have a short temper, but has learned to adjust anger levels according to the appropriateness of the situation
- Gets along well with parents, eager to please
- Has fewer fears than he/she did at younger ages
- Often critical of others, stubborn, and egotistical
- Tends to display anger physically by hitting people/objects, throwing things, or slamming doors
- Friends are important, but with more arguments than before

- May be worrisome and afraid of things
- Caring about what others think is more common
- Often critical of others, stubborn, and egotistical
- Tends to display anger physically by hitting people/objects, throwing things, or slamming doors
- Friends are important, but with more arguments than before
- May be worrisome and afraid of things
- Caring about what others think is more common
- Overall disposition is pleasant and upbeat
- Can become extremely excited over subjects of interest or accomplishments
- Strongly prone to peer pressure and following trends
- More stable friendships with less melodramatics
- May begin to have sexual attraction to interest in peers, particularly girls

2.5.3. Emotional Development

Emotional Development during Infancy

1. Right from the time of birth, the infant cries and his body's movements seem to give evidence of the presence of emotional element in him. What are the specific emotions, if any, he experiences at this stage is a difficult question to be answered.
2. Truly speaking, as Mrs. Hurlock puts it, "*At birth and shortly afterwards the first sign of emotional behaviour is general excitement to strong stimulation. There is no indications of clear cut, definite emotional patterns that can be recognized and identified as specific emotional states", (1959, p. 216).*

Thus, it is the stage of an undifferentiated excitement to any stimulus.

3. The stage of unidentified excitement is over in a very short time, when the general excitement becomes differentiated into simple response that suggests pleasure and displeasure. Stimuli like sudden loud noise, wet, cold or hot objects applied to baby's skin, feeling hungry and uncomfortable etc. bring unpleasant responses. The stimuli like Sucking, patting and warmth etc. bring pleasant responses.
4. The differentiation of general excitement into pleasant and unpleasant responses takes the following pattern according to Spitz:

"During the first two months, pleasure and displeasure come in response to stimulation. By the third month, pleasure is aroused by psychological' stimulus shown in the baby's smile in response to human face. Slightly later displeasure aroused by psychological as well as physical stimuli as may be seen in the baby's reaction to being left alone." (Hurlock, E.B., 1959, p. 217)

5. As said above, before the age of 6 months, the emotional behaviour is expressed through pleasant and unpleasant responses, that is, there are only two emotions (distress and delight up to this stage. When the infant completes his six months, the negative emotions take the lead and gradually in the coming months, fear, disgust, anger, jealousy all is distinguishable. Between the 10th and 12th months the positive emotions like elation love, sympathy, enjoyment all enter in the field. Up to 2 years, as the study of Bridges conducted in 1931 shows almost all the emotions, positive as well as negative, take their shape and become quite distinguishable.

6. There is continuous variation in the manifestation of emotions during infancy. In the earlier months it is very difficult to distinguish on the basis of facial expression and bodily positions. Only the mothers can determine the reasons behind her child's crying and yelling. Later on they gradually become distinguishable. Moreover in the earlier months of infancy, child reacts more violently to emotionally disturbing situations, but as an infant approaches childhood, his crying, yelling and the vigorous movements of the body parts become less and less violent. Gradually with increasing age there is an increase in linguistic responses and a decrease in motor responses.

Emotional Development during Childhood

As said above, almost all the emotions make themselves distinguishable by the beginning of childhood. Therefore, emotional development after the stage of infancy, concerns itself only to the changes in the nature of situations of emotional experiences.

We find the following changes in a child during childhood.

1. In infancy, the child is only concerned with his own well-being. Therefore, the emotions are generally aroused by the conditions which are related with his immediate well-being. But as he grows, his world grows larger and he has to respond to a variety of stimuli. During childhood, peer group relationship and school atmosphere and other environmental factors influence his emotional behaviour. His emotions get linked with new experiences and interests and his emotional behaviour gets linked with the new stimuli. At the same time he does

not react to various old stimuli. For example, he does not show anger at being dressed or bathed, nor does he show any fear of strangers.

2. There is a remarkable change in the expression of emotional behaviour. In infancy his behaviour is usually dominated by too much intensity and is usually expressed through motor responses like crying, yelling etc. But in childhood and especially in later childhood, the child tries to express his behaviour through reasonable means and is the result of many factors. In childhood, the child is in a position to express his feelings through language. Secondly, he becomes social and realises that it may not be desirable or proper for him to show his emotions at all times. Thirdly, his intellect begins to play a proper role in exercising check over emotional outbursts.

Thus, the child advances towards emotional stability and control and during the later period childhood, demonstrates an appreciable degree of control over his emotions.

Emotional Development during Adolescence

The emotional balance is once again disturbed in adolescence. An individual once again experiences the violent and intensive current of emotional experiences. With regard to emotional experiences, this is the period of intensive storm and stress. At no stage this emotional energy as strong and dangerous as in adolescence. It is very difficult for an adolescent to exercise control over his emotions. The sudden functioning of sexual glands and tremendous increase in physical energy makes him restless. Moreover, adolescents are not consistent in their emotions. Emotions during this stage fluctuate very frequently and quickly. It makes them moody. In a very short span of time they could switch between being happy and extremely sad. So there is too much uncertainty in the nature of their emotional state. At this stage, there is a strong need for training of emotions and proper channelization of emotional energy. The William Henry Hadow report has emphasized this need in the following words "*There is a tide which begins to rise in the veins of youth at the age of eleven or twelve. It is called by the name of adolescence. If that tide can be taken at the flood, and a new voyage begun in the strength and along the flow of its current, we think that it will move on to fortune." (Ross. J.S., 1951, p. 153).*

Emotional Development in Adulthood

Emotional development reaches its maximum in adulthood. During this stage, generally, all individuals attain emotional maturity. Let us try to understand what is meant by emotional maturity.

Meaning of Emotional Maturity

In brief, a person can be called emotionally mature if he is able to display his emotions in an appropriate degree with reasonable control. An emotionally mature person will possess the following

(1) Almost all the emotions can be distinctly seen in him and their pattern of expression can be easily recognized.

(2) Manifestation of emotions is very much refined. Usually he expresses his emotions in a socially desirable way.

(3) He is able to exercise control over his emotions. Sudden inappropriate emotional outbursts are rarely found in him. He is able to hide his feelings and check his emotional tide.

(4) The person no more hangs in mere idealism, but he actually perceives the things in their real perspective. He is not a daydreamer and does not possess the desire to run way from realities.

5) The intellectual powers like thinking, reasoning etc. are properly exercised by him in making any decision. He is more guided by his intellect than his emotions.

6) He does not possess the habit of rationalization i.e. he never gives arguments in defence of his own mistakes on others. He is always honest in his behaviour.

7) He possesses an adequate self-concept and self respect. He never like to do the things or to show such behaviour as can injure his self respect and is adverse to his self –concept.

(8) He is not confined to himself. He thinks for others and is keen to maintain social relationship.

(9) He has the courage to exercise his emotions at a proper time in a proper place. If there is a danger to his self respect or if an innocent person is attacked, he can rise to the occasion by exercising his emotion of anger. But if he commits a mistake and is rebuked by his boss, he is equally able to check his emotion of anger. Mature emotional behaviour is characterized by greater stability. Person having such maturity shows no sudden shift from one emotion to another.

2.5.4. Moral Development

Another important aspect of the child's development is learning to differentiate between the rightness and wrongness of human acts. The way children come to distinguish right from wrong, to feel guilty, to put them in other people's position, and to help

others when they are in trouble, are all components of moral development. Just as children pass through the various stages of cognitive development, according to Lawrence Kohlberg, they pass through the various stages of moral development, which are age related. Kohlberg interviewed children in which they were presented with stories in which the characters face moral dilemmas. Children were asked what the characters in the dilemma should do, and why.

According to him, children approach thinking about right and wrong differently at different ages. The young child, i.e. before 9 years of age, thinks in terms of external authority. According to her/him, actions are wrong because s/he is punished, and right because she/he is rewarded. As the child grows, i.e. by early adolescence, s/he develops moral reasoning through set of rules of others, such as parents or laws of the society. These rules are accepted by the children as their own. These are "internalized" in order to be virtuous and to win approval from others (not to avoid punishment).

Children view rules as absolute guidelines, which should be followed. Moral thinking at this stage is relatively inflexible. As they grow, they gradually develop a personal moral code. You have seen that by the end of childhood a more gradual growth rate enables the child to develop skills of coordination and balance. Language develops and the child can reason logically. Socially the child has become more involved in social systems, such as family and peer group. The next section traces changes in human development during adolescence and adulthood.

Jean Piaget, a Swiss psychologist, explored how children developed moral reasoning. He rejected the idea that children learn and internalize the rules and morals of society by being given the rules and forced to adhere to them. Through his research on how children formed their judgments about moral behaviour, he recognized that children learn morality best by having to deal with others in groups. He reasoned that there was a process by which children conform to society's norms of what is right and wrong, and that the process was active rather than passive.

Piaget found two main differences in how children thought about moral behaviour. Very young children's thinking is based on how actions affected them or what the results of an action were. For example, young children will say that when trying to reach a forbidden cookie jar, breaking 10 cups is worse than breaking one. They also recognize the sanctity of rules. For example, they understand that they cannot make up new rules to a game; they have to play by what the rule book says or what is commonly known to be the rules. Piaget called this "moral realism with objective responsibility." It explains why young children are concerned with outcomes rather than intentions.

Older children look at motives behind actions rather than consequences of actions. They are also able to examine rules, determining whether they are fair or not, and apply these rules and their modifications to situations requiring negotiation, assuring that everyone affected by the rules is treated fairly. Piaget felt that the best moral learning came from these cooperative decision-making and problem-solving events. He also believed that children developed moral reasoning quickly and at an early age.

Lawrence Kohlberg, an American psychologist, extended Piaget's work in cognitive reasoning into adolescence and adulthood. He felt that moral development was a slow process and evolved over time. Still, his six stages of moral development, drafted in 1958, mirrors Piaget's early model. Kohlberg believed that individuals made progress by mastering each stage, one at a time. A person could not skip stages. He also felt that the only way to encourage growth through these stages was by discussion of moral dilemmas and by participation in consensus democracy within small groups. Consensus democracy was rule by agreement of the group, not majority rule. This would stimulate and broaden the thinking of children and adults, allowing them to progress from one stage to another.

Pre-Conventional Level:

The child at the first and most basic level, the pre-conventional level, is concerned with avoiding punishment and getting needs met. This level has two stages and applies to children up to 10 years of age.

Stage one is the Punishment-Obedience stage. Children obey rules because they are told to do so by an authority figure (parent or teacher), and they fear punishment if they do not follow rules. Children at this stage are not able to see someone else's side.

Stage two is the Individual, Instrumentation, and Exchange stage. Here, the behaviour is governed by moral reciprocity. The child will follow rules if there is a known benefit to him or her. Children at this stage also mete out justice in an eye-for-an-eye manner or according to Golden Rule logic. In other words, if one child hits another, the injured child will hit back. This is considered equitable justice. Children in this stage are very concerned with what is fair.

Children will also make deals with each other and even adults. They will agree to behave in a certain way for a payoff. "I'll do this, if you will do that." Sometimes, the payoff is in the knowledge that behaving correctly is in the child's own best interest. They receive approval from authority figures or admiration from peers, avoids blame,

or behaves in accordance with their concept of self. They are just beginning to understand that others have their own needs and drives.

Conventional Level:

This level broadens the scope of human wants and needs. Children in this level are concerned about being accepted by others and living up to their expectations. This stage begins around age 10 but lasts well into adulthood, and is the stage most adults remain at throughout their lives.

Stage three, Interpersonal Conformity, is often called the "good boy/good girl" stage. Here, children do the right thing because it is good for the family, peer group, team, school, or church. They understand the concepts of trust, loyalty, and gratitude. They abide by the Golden Rule as it applies to people around them every day. Morality is acting in accordance to what the social group says is right and moral.

Stage four is the Law and Order, or Social System and Conscience stage. Children and adults at this stage abide by the rules of the society in which they live. These laws and rules become the backbone for all right and wrong actions. Children and adults feel compelled to do their duty and show respect for authority. This is still moral behaviour based on authority, but reflects a shift from the social group to society at large.

Post-Conventional Level:

Some teenagers and adults move beyond conventional morality and enter morality based on reason, examining the relative values and opinions of the groups with which they interact. Few adults reach this stage.

Correct behaviour is governed by the sixth stage, the Social Contract and Individual Rights stage. Individuals in this stage understand that codes of conduct are relative to their social group. This varies from culture to culture and subgroup to subgroup. With that in mind, the individual enters into a contract with fellow human beings to treat them fairly and kindly and to respect authority when it is equally moral and deserved. They also agree to obey laws and social rules of conduct that promote respect for individuals and value the few universal moral values that they recognize. Moral behaviour and moral decisions are based on the greatest good for the greatest number.

Stage six is the Principled Conscience or the Universal/Ethical Principles stage. Here, individuals examine the validity of society's laws and govern themselves by what they consider to be universal moral principles, usually involving equal rights and

respect. They obey laws and social rules that fall in line with these universal principles, but not others they deem as aberrant. Adults here are motivated by individual conscience that transcends cultural, religious, or social convention rules. Kohlberg recognized this last stage but found so few people who lived by this concept of moral behaviour that he could not study it in detail.

2.5.5 Play Development

Every parent wants their child to grow up to be a responsible and well-adjusted adult, who should have meaningful friendships and relationships in his life. For this, we need to teach them about social skills. But how do you do that? The first thing to remember is that these skills are not genetic, i.e., your child is not born with them; hence your child will need to acquire these skills. And you can help a great deal in helping your child to achieve the same. Here are the important stages of play and the ages associated with it.

As children develop and grow so does their way of playing. Mildred Parten did some great work observing youngsters at play, and developed the stages of social play for children. Let's take a brief look at how social play develops and changes over time for children. There are six stages of social play and it starts at birth.

Unoccupied Play (Birth-3 Months):

At this stage baby is just making a lot of movements with their arms, legs, hands, feet, etc. They are learning about and discovering how their body moves.

Solitary Play (Birth-2 Years):

This is the stage when a child plays alone. They are not interested in playing with others quite yet.

Spectator/Onlooker Behaviour (2 Years):

During this stage a child begins to watch other children playing but does not play with them.

Parallel play (2+ Years):

When a child plays alongside or near others but does not play with them this stage is referred to as parallel play.

Associate Play (3-4 Years):

When a child starts to interact with others during play, but there is not a large amount of interaction at this stage. A child might be doing an activity related to the kids

around him, but might not actually be interacting with another child. For example, kids might all be playing on the same piece of playground equipment but all doing different things like climbing, swinging, etc.

Cooperative / Social Play (4+ years):

When a child plays together with others and has interest in both the activity and other children involved in playing they are participating in cooperative play.

As children proceed in the stages of play, their play becomes more complex and involves more and more interacting with others. For children to practice social skills like cooperating, compromising and problem solving, the best way to do that is to let them play. They'll remember the rhythms and melodies of social interactions much more smoothly if we allow them the time and space to play.

2.5.6. Language Development

In nearly all cases, children's language development follows a predictable sequence. However, there is a great deal of variation in the age at which children reach a given milestone. Furthermore, each child's development is usually characterized by gradual acquisition of particular abilities: thus "correct" use of English verbal inflection will emerge over a period of a year or more, starting from a stage where verbal inflections are always left out, and ending in a stage where they are nearly always used correctly.

There are also many different ways to characterize the developmental sequence. On the production side, one way to name the stages is as follows, focusing primarily on the unfolding of lexical and syntactic knowledge:

Language development is the process by which children come to understand and communicate language during early childhood.

From birth up to the age of five, children develop language at a very rapid pace. The stages of language development are universal among humans. However, the age and the pace at which a child reaches each milestone of language development vary greatly among children. Thus, language development in an individual child must be compared with norms rather than with other individual children. In general girls develop language at a faster rate than boys. More than any other aspect of development, language development reflects the growth and maturation of the brain. After the age of five it becomes much more difficult for most children to learn language.

Receptive language development (the ability to comprehend language) usually develops faster than expressive language (the ability to communicate). Two different styles of language development are recognized. In referential language development, children

first speak single words and then join words together, first into two-word sentences and then into three-word sentences. In expressive language development, children first speak in long unintelligible babbles that mimic the cadence and rhythm of adult speech. Most children use a combination these styles.

Infancy

Language development begins before birth. Towards the end of pregnancy, a fetus begins to hear sounds and speech coming from outside the mother's body. Infants are acutely attuned to the human voice and prefer it to other sounds. In particular they prefer the higher pitch characteristic of female voices. They also are very attentive to the human face, especially when the face is talking. Although crying is a child's primary means of communication at birth, language immediately begins to develop via repetition and imitation.

Between birth and three months of age, most infants acquire the following abilities:

- seem to recognize their mother's voice
- quiet down or smile when spoken to
- turn toward familiar voices and sounds
- make sounds indicating pleasure
- cry differently to express different needs
- grunt, chuckle, whimper, and gurgle
- begin to coo (repeating the same sounds frequently) in response to voices
- make vowel-like sounds such as "ooh" and "ah"

Between three and six months, most infants can do the following:

- turn their head toward a speaker
- watch a speaker's mouth movements
- respond to changes in a tone of voice
- make louder sounds including screeches
- vocalize excitement, pleasure, and displeasure
- cry differently out of pain or hunger
- laugh, squeal, and sigh
- sputter loudly and blow bubbles

- shape their mouths to change sounds
- vocalize different sounds for different needs
- communicate desires with gestures
- babble for attention
- mimic sounds, inflections, and gestures
- make many new sounds, including “p,” “b,” and “m,” that may sound almost speech-like

The sounds and babblings of this stage of language development are identical in babies throughout the world, even among those who are profoundly deaf. Thus all babies are born with the capacity to learn any language. Social interaction determines which language they eventually learn.

Six to 12 months is a crucial age for receptive language development. Between six and nine months babies begin to do the following:

- search for sources of sound
- listen intently to speech and other sounds
- take an active interest in conversation even if it is not directed at them
- recognize “dada,” “mama,” “bye-bye”
- consistently respond to their names
- respond appropriately to friendly and angry tones
- express their moods by sound and body language
- play with sounds
- make long, more varied sounds
- babble random combinations of consonants and vowels
- babble in singsong with as many as 12 different sounds
- experiment with pitch, intonation, and volume
- use their tongues to change sounds
- repeat syllables
- imitate intonation and speech sounds

Between nine and 12 months babies may begin to do the following:

- listen when spoken to
- recognize words for common objects and names of family members
- respond to simple requests
- understand "no"
- understand gestures
- associate voices and names with people
- know their own names
- Babble both short and long groups of sounds and two-to-three-syllable repeated sounds (The babble begins to have characteristic sounds of their native language.)
- use sounds other than crying to get attention
- use "mama" and "dada" for any person
- shout and scream
- repeat sounds
- use most consonant and vowel sounds
- practice inflections
- engage in much vocal play

Toddlerhood

During the second year of life language development proceeds at very different rate in different children. By the age of 12 months, most children use "mama/dada" appropriately. They add new words each month and temporarily lose words. Between 12 and 15 months children begin to do the following:

- recognize names
- understand and follow one-step directions
- laugh appropriately
- use four to six intelligible words, usually those starting with "b," "c," "d," and "g," although less than 20 percent of their language is comprehensible to outsiders
- use partial words

- gesture and speak “no”
- ask for help with gestures and sounds

At 15 to 18 months of age children usually do the following:

- understand “up,” “down,” “hot,” “off”
- use 10 to 20 intelligible words, mostly nouns
- use complete words
- put two short words together to form sentences
- chatter and imitate, use some echolalia (repetitions of words and phrases)
- have 20 to 25 percent of their speech understood by outsiders

At 18 to 24 months of age toddlers come to understand that there are words for everything and their language development gains momentum. About 50 of a child’s first words are universal: names of foods, animals, family members, toys, vehicles, and clothing. Usually children first learn general nouns, such as “flower” instead of “dandelion,” and they may over generalize words, such as calling all toys “balls.” Some children learn words for social situations, greetings, and expressions of love more readily than others. At this age children usually have 20 to 50 intelligible words and can do the following:

- follow two-step directions
- point to parts of the body
- attempt multi-syllable words
- speak three-word sentences
- ask two-word questions
- enjoy challenge words such as “helicopter”
- hum and sing
- express pain verbally
- have 50 to 70 percent of their speech understood by outsiders

After several months of slower development, children often have a “word spurt” (an explosion of new words). Between the ages of two and 18 years, it is estimated that children add nine new words per day. Between two and three years of age children acquire:

- a 400-word vocabulary including names
- a word for most everything
- the use of pronouns
- three to five-word sentences
- the ability to describe what they just saw or experienced
- the use of the past tense and plurals
- names for body parts, colours, toys, people, and objects
- the ability to repeat rhymes, songs, and stories
- the ability to answer "what" questions

Children constantly produce sentences that they have not heard before, creating rather than imitating. This creativity is based on the general principles and rules of language that they have mastered. By the time a child is three years of age, most of a child's speech can be understood. However, like adults, children vary greatly in how much they choose to talk.

Preschool

Three to four-year-olds usually can do the following:

- understand most of what they hear
- converse
- have 900 to 1,000-word vocabularies, with verbs starting to predominate
- usually talk without repeating syllables or words
- use pronouns correctly
- use three to six-word sentences
- ask questions
- relate experiences and activities
- tell stories (Occasional stuttering and stammering is normal in preschoolers.)

Language skills usually blossom between four and five years of age. Children of this age can do the following:

- verbalize extensively
- communicate easily with other children and adults

- articulate most English sounds correctly
- know 1,500 to 2,500 words
- use detailed six to eight-word sentences
- can repeat four-syllable words
- use at least four prepositions
- tell stories that stay on topic
- can answer questions about stories

School age

At age five most children can do the following:

- follow three consecutive commands
- talk constantly
- ask innumerable questions
- use descriptive words and compound and complex sentences
- know all the vowels and consonants
- use generally correct grammar

Six-year-olds usually can correct their own grammar and mispronunciations. Most children double their vocabularies between six and eight years of age and begin reading at about age seven. A major leap in reading comprehension occurs at about nine. Ten-year-old begins to understand figurative word meanings.

Adolescents generally speak in an adult manner, gaining language maturity throughout high school.

2.5.7. Educational Implication of Studying Human Development

- Education is not only a process and a product of growing, it means growing. It aims at the fullest possible realization of all the potentialities of children. This implies that teachers and parents must know what children are capable of and what potentialities they possess. Equipped with this knowledge they should provide suitable opportunities and favorable environmental facilities which are conducive to the maximum growth of children. Apart from these opportunities, it is necessary that their attitudes are helpful, encouraging and sympathetic.

- School programmers, procedures and practices should be adjusted to the growth and maturational levels of children, bearing in mind the individual variations in rates of growth. Since various aspects of growth are interrelated, parents and teachers should pay attention to all aspects. Good physical growth, for example, through the provision of play, games and sports, is conducive to effective intellectual development; malnutrition has been found to be an important factor that retards development: hence, teachers and parents should cooperate in cultivating among pupils habits of balanced eating.
- The principles of development have highlighted the importance of "individual differences" from one child to the other and from one stage to another. This fact justifies the provision of diversified courses for the development of specific talents, abilities and interests and a rich and varied programme of co-curricular activities. Similarly, the curricular activities should be based on the needs and interests of various stages of growth i.e., childhood, boyhood or later childhood, pre- adolescence and adolescence.
- Each stage of growth has its possibilities and limitations. This implies that teachers and parents should not demand of pupils or children what is beyond their stage of growth. If they do so, they will only cause frustrations, heighten tension and nervousness in children. For example, it is wrong to expect a primary school child to appreciate abstract concepts and theories.
- The 'inter-relatedness of growth' demands presentation of knowledge in an interrelated manner and its integration with action. Since each child grows in his own unique way, it is but opposite that parents and teachers should treat each child as a unique individual and provide for this special needs and interests.

2.6. Cognitive Development

The term "cognition" refers to all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used. It is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and hallucinations. Cognitive psychology is a discipline within psychology that investigates the internal mental processes of thought such as visual processing, memory, thinking, learning, feeling, problem solving, and language. Cognitive psychology is different from previous psychological approaches in two major ways: (i) It accepts the use of the scientific method, and (ii) It generally rejects introspection as a valid method of investigation. Unlike Freudian approach it does not believe in symbolism. It explicitly

acknowledges the existence of internal mental states (such as belief, desire and motivation). It is believed that cognitive development takes place during - at a more rapid pace and the ability to think, contemplate and analyze etc. become all the more sharp.

2.6.1. Piaget 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.

What Piaget wanted to do was not to measure how well children could count, spell or solve problems as a way of grading their I.Q. What he was more interested in was the way in which fundamental concepts like the very idea of number, time, quantity, causality, and justice and so on emerged.

Before Piaget's work, the common assumption in psychology was that children are merely less competent thinkers than adults. Piaget showed that young children think in strikingly different ways compared to adults.

According to Piaget, children are born with a very basic mental structure (genetically inherited and evolved) on which all subsequent learning and knowledge are based.

Piaget's Theory Differs From Others In Several Ways:

- It is concerned with children, rather than all learners.
- It focuses on development, rather than learning per se, so it does not address learning of information or specific behaviors.

- It proposes discrete stages of development, marked by qualitative differences, rather than a gradual increase in number and complexity of behaviors, concepts, ideas, etc.

The goal of the theory is to explain the mechanisms and processes by which the infant, and then the child, develops into an individual who can reason and think using hypotheses.

To Piaget, cognitive development was a progressive reorganization of mental processes as a result of biological maturation and environmental experience. Children construct an understanding of the world around them, then experience discrepancies between what they already know and what they discover in their environment.

There Are Three Basic Components To Piaget's Cognitive Theory:

1. Schemas (building blocks of knowledge).
2. A daptation processes that enable the transition from one stage to another (equilibrium, assimilation, and accommodation).
3. Stages of Cognitive Development:

1. Sensorimotor,
2. Preoperational,
3. Concrete operational,
4. Formal operational.

Imagine what it would be like if you did not have a mental model of your world. It would mean that you would not be able to make so much use of information from your past experience or to plan future actions.

Schemas are the basic building blocks of such cognitive models, and enable us to form a mental representation of the world. Piaget (1952) defined a schema as: "*a cohesive, repeatable action sequence possessing component actions that are tightly interconnected and governed by a core meaning.*"

In more simple terms Piaget called the schema the basic building block of intelligent behavior – a way of organizing knowledge. Indeed, it is useful to think of schemas as "units" of knowledge, each relating to one aspect of the world, including objects, actions, and abstract (i.e., theoretical) concepts.

Wadsworth (2004) suggests that schemata (the plural of schema) be thought of as 'index cards' filed in the brain, each one telling an individual how to react to incoming stimuli or information.

When Piaget talked about the development of a person's mental processes, he was referring to increases in the number and complexity of the schemata that a person had learned.

When a child's existing schemas are capable of explaining what it can perceive around it, it is said to be in a state of equilibrium, i.e., a state of cognitive (i.e., mental) balance.

Piaget emphasized the importance of schemas in cognitive development and described how they were developed or acquired. A schema can be defined as a set of linked mental representations of the world, which we use both to understand and to respond to situations. The assumption is that we store these mental representations and apply them when needed.

For example, a person might have a schema about buying a meal in a restaurant. The schema is a stored form of the pattern of behavior which includes looking at a menu, ordering food, eating it and paying the bill. This is an example of a type of schema called a 'script.' Whenever they are in a restaurant, they retrieve this schema from memory and apply it to the situation.

The schemas Piaget described tend to be simpler than this - especially those used by infants. He described how - as a child gets older - his or her schemas become more numerous and elaborate.

Piaget believed that newborn babies have a small number of innate schemas - even before they have had many opportunities to experience the world. These neonatal schemas are the cognitive structures underlying innate reflexes. These reflexes are genetically programmed into us.

For example, babies have a sucking reflex, which is triggered by something touching the baby's lips. A baby will suck a nipple, a comforter (dummy), or a person's finger. Piaget, therefore, assumed that the baby has a 'sucking schema.'

Similarly, the grasping reflex which is elicited when something touches the palm of a baby's hand, or the rooting reflex, in which a baby will turn its head towards something which touches its cheek, are innate schemas. Shaking a rattle would be the combination of two schemas, grasping and shaking.

Assimilation and Accommodation

Jean Piaget viewed intellectual growth as a process of adaptation (adjustment) to the world. This happens through:

- Assimilation – Which is using an existing schema to deal with a new object or situation?
- Accommodation – This happens when the existing schema (knowledge) does not work, and needs to be changed to deal with a new object or situation.
- Equilibration – This is the force which moves development along. Piaget believed that cognitive development did not progress at a steady rate, but rather in leaps and bounds.

Equilibrium occurs when a child's schemas can deal with most new information through assimilation. However, an unpleasant state of disequilibrium occurs when new information cannot be fitted into existing schemas (assimilation).

Equilibration is the force which drives the learning process as we do not like to be frustrated and will seek to restore balance by mastering the new challenge (accommodation). Once the new information is acquired the process of assimilation with the new schema will continue until the next time we need to make an adjustment to it.

Example of Assimilation

A 2-year-old child sees a man who is bald on top of his head and has long frizzy hair on the sides. To his father's horror, the toddler shouts "Clown, clown" (Siegler et al., 2003).

Example of Accommodation

In the "clown" incident, the boy's father explained to his son that the man was not a clown and that even though his hair was like a clown's, he wasn't wearing a funny costume and wasn't doing silly things to make people laugh.

With this new knowledge, the boy was able to change his schema of "clown" and make this idea fit better to a standard concept of "clown".

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 test hypotheses.

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.
- Critical Evaluation Support

- The influence of Piaget's ideas in developmental psychology has been enormous. He changed how people viewed the child's world and their methods of studying children.
- He was an inspiration to many who came after and took up his ideas. Piaget's ideas have generated a huge amount of research which has increased our understanding of cognitive development.

- His ideas have been of practical use in understanding and communicating with children, particularly in the field of education.

2.6.2. Vygotsky

Vygotsky's Sociocultural Perspective:

Psychologists today recognize that culture shapes cognitive development by determining what and how the child will learn about the world- the content and processes of thinking. In this aspect, a major spokesperson for this socio cultural theory was Russian psychologist who died almost 80 years ago. Lev Semenovich Vygotsky was only 38 when he died of tuberculosis, but during his brief life he produced over 100 books and articles. Vygotsky began studying learning and development to improve his own teaching. He went on to write about language and thought, the psychology of art, learning and development, and educating students with special needs. His work was banned in Russia for many years because he referenced Western psychologists. But in the past 40 years, with the rediscovery of his writings, Vygotsky's ideas have become major influences in psychology and education and have provided alternatives to many of Piaget's theories (Gredler, 2009; Kozulin, 2003; Van Der Veer, 07; Wink & Putney, 2002).

Vygotsky elaborated the socio cultural theory of development. His ideas about language, culture, and cognitive development have become major influences in the fields of psychology and education. He believed that human activities take place in cultural settings and that they cannot be understood apart from these settings. One of his key ideas was that our specific mental structures and processes can be traced to our interactions with others. These social interactions are more than simple influences on cognitive development-they actually create our cognitive structures and thinking processes (Palincsar, 1998). In fact, Vygotsky conceptualized development as the transformation of socially shared activities into internalized processes" John-Steiner & Mahn, 1996, p. 192). We will examine three themes in Vygotsky's writings that explain how social processes form learning and thinking: the social sources of individual thinking; the role of cultural tools in learning and development, especially the tool of language; and the zone of proximal development (Driscoll, 2005; Wertsch & Tulviste, 1992).

The Social Sources of Individual Thinking

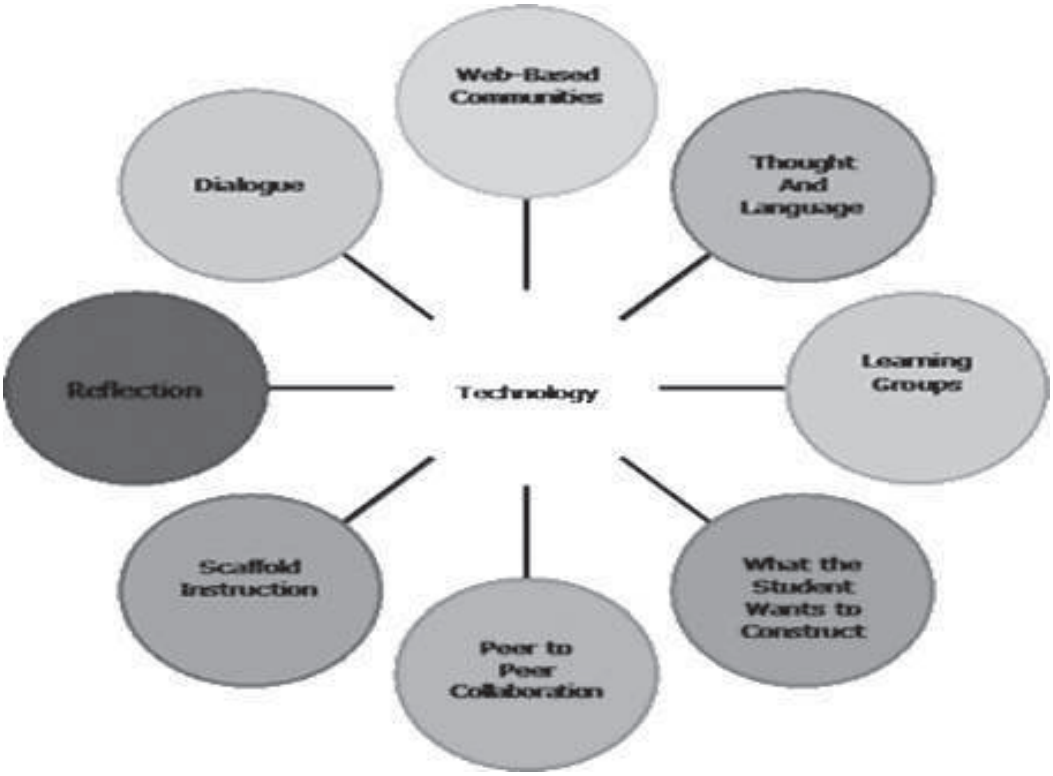
He assumed that every function in a child's cultural development appears twice: first, on the social level and later on the individual level; first between people (inter psychological) and then inside the child (intra psychological. This applies equally to

voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals (1978, p.57)

In other words, higher mental processes, such as directing your own attention and thinking through problems, first are co-constructed during shared activities between the child and another person. Then these co-constructed processes are internalized by the child and become part of that child's cognitive development (Gredler, 2009). So, for Vygotsky, social interaction was more than influence; it was the origin of higher mental processes such as problem solving.

For example, a six year old has lost a toy and asks her father for help. The father asks her where she last saw the toy; the child says "I cannot remember". He asks a series of questions —— did you have it in your room? Outside? Next door? To each question, the child answers, "no" When he says, "in the car?" She says, "I think so" and goes to retrieve the toy. (Tharp & Gallimore, 1998, p.14)

Cultural Tools and Cognitive Development:



Vygotsky believed that cultural tools, including technical tools (such as printing presses, plows, rules, abacuses, graph paper today, we would add mobile devices, computer, internet and, assistive technologies for students with learning challenges, psychological tools (Signs and symbol systems such as numbers and mathematical systems, Braille and sign language, maps, works of art, codes, and language) play very important roles in cognitive development. For example, as long as the culture provides only Roman numerals for representing quantity, certain ways of thinking mathematically-from long division to calculus-are difficult or impossible. But if a number system has a zero, fractions, positive and negative values, and an infinite quantity of numbers, then much more is possible. The number system is a psychological tool that supports learning and cognitive development it changes the thinking process. This symbol system is passed from adult to child and from child to child through formal and informal interactions and teachings.

Technical Tools in a Digital Age.

The use of technical tools such as calculators and spell checkers has been somewhat controversial in education. Technology is increasingly "checking up" on us. I rely on the spell checker in my word processing program to protect me from embarrassment. But I also read student papers with spelling replacements that must have come from decisions made by the word processing program—without a "sense check" by the writer. Is student learning harmed or helped by these technology supports? Just because students learned mathematics in the past with paper-and-pencil procedures and practice does not mean that this is the best way to learn. For example, in the Third International Mathematics and Science Study (TIMSS, 1998), on every test at the advanced level, students who said that they used calculators in their daily math course-work performed much better than students who rarely or never used calculators. In fact, the research on calculators over the past decade has found that rather than eroding basic skills, calculator use has positive effects on students' problem-solving skills and attitudes toward math (Waits & Demana, 2000).

Psychological Tools.

Vygotsky believed that all higher-order mental processes such as reasoning and problem solving are mediated by (accomplished through and with the help of) psychological tools. These tools allow children to transform their thinking by enabling them to gain greater and greater mastery of their own cognitive processes; thus they advance their own development as they use the tools. In fact, Vygotsky believed the essence of cognitive development is mastering the use of psychological tools such as language

to accomplish the kind of advanced thinking and problem solving that could not be accomplished without those tools (Gredler, 2009; Karpov& Haywood, 1998). The process is something like this: As children engage in activities with adults or more capable peers, they exchange ideas and ways of thinking about or representing concepts drawing maps, for example, as a way to represent spaces and places. Children internalize these co-created ideas. Thus, children's knowledge, ideas, attitudes, and values develop through appropriating or "taking for themselves" the ways of acting and thinking provided by both their culture and other members of their group (Wertsch, 2007).In this exchange of signs and symbols and explanations, children begin to develop a cultural tool kit" to make sense of and learn about their world (Wertsch, 1991). The kit is filled with technical tools such as graphing calculators or rulers directed toward the external world and psychological tools for acting mentally such as concepts, problem- solving strategies, and (as we saw earlier) argument stratagems. Children do not just receive the tools, however. They transform the tools as they construct their own representations, symbols, patterns, and understandings. As we learned from Piaget, children's Constructions of meaning are not the same as those of adults. In the exchange of signs and symbols such as language, children create their own understandings (a raccoon is a "kitty"). These understandings are gradually changed (a raccoon is a raccoon) as the children continue to engage in social activities and try to make sense of their world John-Steiner & Mahn, 1996; W Wertsch, 1991). In Vygotsky's theory, language is the most important symbol system in the tool kit, and it is the one that helps to fill the kit with other tools.

The Role of Language and Private Speech:

Language is critical for cognitive development because it provides a way to express ideas and ask questions, the categories and concepts for thinking, and the links between the past and the future. Language frees us from the immediate situation to think about what was and what might be (Das, 1995; Driscoll, 2005).

Vygotsky thought that: the specifically human capacity for language enables children to provide for auxiliary tools in the solution of difficult tasks, to overcome impulsive action, to plan a solution to a problem prior to its execution, and to master their own behaviour. (1978, p. 28)

Vygotsky placed more emphasis than Piaget on the role of learning and language in cognitive development. He believed that "thinking" depends on speech, on the means of thinking, and on the child's socio-cultural experience" (Vygotsky, 1978a, p.120). In fact Vygotsky believed that language in the form of private speech (talking to yourself) guides cognitive development.

Private Speech:

If you have spent much time around young children, you know that they often talk to themselves as they play. This can happen when the child is alone or, even more often, in a group of children — each child talks enthusiastically, without any real interaction or conversation. In this aspect, Vigotsky suggested that these mutterings play an important role in cognitive development they move children in stages toward self-regulation; the ability to plan, monitor, guide your own thinking and problem solving. First the child's behavior is regulated by other using language and other signs such as gestures.

The Zone of Proximal Development

According to Vygotsky, at any given point in development, there are certain problems that a child is on the verge of being able to solve. The child just needs some structure, clues, reminders, help with remembering details or steps, encouragement to keep trying, and so on. Some problems, of course, are beyond the child's capabilities, even if every step is explained clearly. The zone of proximal development (ZPD) is the area between the child's current development level "as determined by independent problem solving" and the level of development that the child could achieve "through adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). It is a dynamic and changing space as student and teacher interact and understandings are exchanged. This is the area where instruction can succeed. Kathleen Berger (2012) called this area the "magic middle"-somewhere between what the student already knows and what the student isn't ready to learn.

Private Speech and the Zone.

We can see how Vygotsky's beliefs about the role of private speech in cognitive development fit with the notion of the zone of proximal development. Often, an adult uses verbal prompts and structuring to help a child solve a problem or accomplish a task. We will see later that this type of support has been called scaffolding. This support can be gradually reduced as the child takes over the guidance, perhaps first by giving the prompts as private speech and finally as inner speech.

The Role of Learning and Development:

Vygotsky believed that learning is an active process that does not have to wait for readiness. In fact, "properly organized learning results in mental development and sets in motion a variety of developmental processes that would be impossible apart from learning" Vygotsky, 1978, p.90) he saw learning as tool in development—learning

pulls development up to higher levels and social interaction is a key in learning (Glassman, 2001; wink & Putney, 2002). Vygotsky's belief that learning pulls development to higher levels means that other people, including teachers, play a significant role in cognitive development.

Educational Implications of Vygotsky's Theory:

Vygotsky believed that the main goal of education was the development of higher mental functions, not simply filling student's memories with facts. So Vygotsky probably would oppose educational curricula that are in inch deep and mile wide or seem like "trivial pursuit".

He believed that the child is not alone in the world "discovering" the cognitive operations of conversations or classifications. This discovery is assisted or mediated by family members, teachers, peers, and even software tools (Puntambekar & Hubscher, 2005).

Therefore, it presumed that Vygotsky's theory suggests that teacher need to do more than just arrange environment so that students can discover on their own. Children cannot and should not be expected to reinvented or rediscover knowledge already available in their culture. Rather they should be guided and assisted in their learning (Karpov & Haywood, 1998).

Assisted learning, or guided participation, requires first learning from the student what is need; then giving information, prompts, reminders and encouragement at the right time and in the right amounts; and gradually allowing the students to do more and their own. Teacher can assist learning by adapting materials or problems to students' current levels; demonstration skills or thought processes; walking students through the steps of a complicated problem; doing part of the problem (for example, in algebra, the students set up the equation and the teacher does the calculations or vice versa); giving detailed feedback and allowing revisions or asking questions that refocus students' attention (Rosenshine & Meister, 1992)

2.6.3. Kohlberg's Moral Development

Lawrence Kohlberg (1958) agreed with Piaget's (1932) theory of moral development in principle but wanted to develop his ideas further. He used Piaget's storytelling technique to tell people stories involving moral dilemmas. In each case, he presented a choice to be considered, for example, between the rights of some authority and the needs of some deserving individual who is being unfairly treated.

One of the best known of Kohlberg's (1958) stories concerns a man called Heinz who lived somewhere in Europe.

Heinz's wife was dying from a particular type of cancer. Doctors said a new drug might save her. The drug had been discovered by a local chemist, and the Heinz tried desperately to buy some, but the chemist was charging ten times the money it cost to make the drug, and this was much more than the Heinz could afford.

Heinz could only raise half the money, even after help from family and friends. He explained to the chemist that his wife was dying and asked if he could have the drug cheaper or pay the rest of the money later.

The chemist refused, saying that he had discovered the drug and was going to make money from it. The husband was desperate to save his wife, so later that night he broke into the chemist's and stole the drug.

Kohlberg asked a series of questions such as:

1. Should Heinz have stolen the drug?
2. Would it change anything if Heinz did not love his wife?
3. What if the person dying was a stranger, would it make any difference?
4. Should the police arrest the chemist for murder if the woman died?

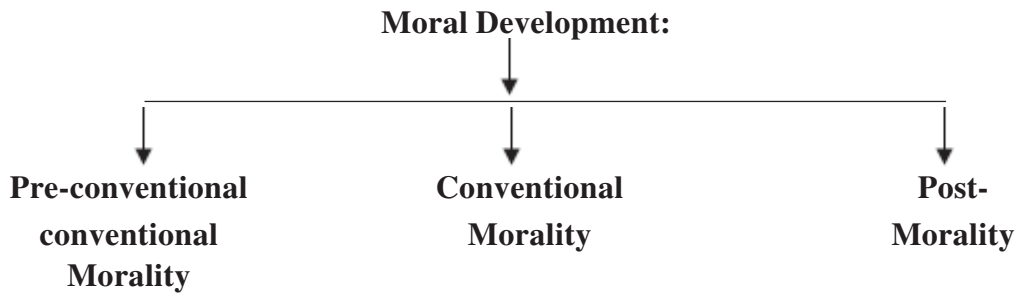
By studying the answers from children of different ages to these questions, Kohlberg hoped to discover how moral reasoning changed as people grew older. The sample comprised 72 Chicago boys aged 10–16 years, 58 of whom were followed up at three-yearly intervals for 20 years (Kohlberg, 1984).

Each boy was given a 2-hour interview based on the ten dilemmas. What Kohlberg was mainly interested in was not whether the boys judged the action right or wrong, but the reasons given for the decision. He found that these reasons tended to change as the children got older.

Kohlberg identified three distinct levels of moral reasoning: pre-conventional, conventional, and post-conventional. Each level has two sub-stages.

People can only pass through these levels in the order listed. Each new stage replaces the reasoning typical of the earlier stage. Not everyone achieves all the stages.

Kohlberg's Stages of Moral Development



Level 1 - Pre-conventional morality

At the pre-conventional level (most nine-year-old and younger, some over nine), we don't have a personal code of morality. Instead, our moral code is shaped by the standards of adults and the consequences of following or breaking their rules. Authority is outside the individual and reasoning is based on the physical consequences of actions.

• **Stage 1. Obedience and Punishment Orientation-** The child/individual is good in order to avoid being punished. If a person is punished, they must have done wrong.

• **Stage 2. Individualism and Exchange-** At this stage, children recognize that there is not just one right view that is handed down by the authorities. Different individuals have different viewpoints.

Level 2 - Conventional morality

At the conventional level (most adolescents and adults), we begin to internalize the moral standards of valued adult role models. Authority is internalized but not questioned, and reasoning is based on the norms of the group to which the person belongs.

Stage 3. Good Interpersonal Relationships- The child/individual is good in order to be seen as being a good person by others. Therefore, answers relate to the approval of others.

Stage 4. Maintaining the Social Order- The child/individual becomes aware of the wider rules of society, so judgments concern obeying the rules in order to uphold the law and to avoid guilt.

Level 3 - Post-conventional morality

Individual judgment is based on self-chosen principles, and moral reasoning is based on individual rights and justice. According to Kohlberg this level of moral reasoning is as far as most people get. Only 10-15% are capable of the kind of abstract thinking necessary for stage 5 or 6 (post-conventional morality). That is to say, most people take their moral views from those around them and only a minority thinks through ethical principles for themselves.

Stage5. Social Contract and Individual Rights- The child/individual becomes aware that while rules/laws might exist for the good of the greatest number, there are times when they will work against the interest of particular individuals. The issues are not always clear-cut. For example, in Heinz's dilemma, the protection of life is more important than breaking the law against stealing.

Stage 6. Universal Principles- People at this stage have developed their own set of moral guidelines which may or may not fit the law. The principles apply to everyone. e.g., human rights, justice, and equality. The person will be prepared to act to defend these principles even if it means going against the rest of society in the process and having to pay the consequences of disapproval and or imprisonment. Kohlberg doubted few people reached this stage.

Problems of Kohlberg Moral Development Theory:

1. The dilemmas are artificial (i.e., they lack ecological validity) Most of the dilemmas are unfamiliar to most people (Rosen, 1980). For example, it is all very well in the Heinz dilemma asking subjects whether Heinz should steal the drug to save his wife. However, Kohlberg's subjects were aged between 10 and 16. They have never been married, and never been placed in a situation remotely like the one in the story. How should they know whether Heinz should steal the drug?

2. The sample is biased:

According to Gilligan (1977), because Kohlberg's theory was based on an all-male sample, the stages reflect a male definition of morality (it's andocentric). Mens' morality is based on abstract principles of law and justice, while womens' is based on principles of compassion and care. Further, the gender bias issue raised by Gilligan is a reminded of the significant gender debate still present in psychology, which when ignored, can have a large impact on the results obtained through psychological research.

3. The dilemmas are hypothetical (i.e., they are not real) In a real situation, what course of action a person takes will have real consequences – and sometimes very unpleasant ones for themselves? Would subjects reason in the same way if they were placed in a real situation? We just don't know.

The fact that Kohlberg's theory is heavily dependent on an individual's response to an artificial dilemma brings a question to the validity of the results obtained through this research. People may respond very differently to real life situations that they

find themselves in than they do with an artificial dilemma presented to them in the comfort of a research environment.

4. Poor research design:

The way in which Kohlberg carried out his research when constructing this theory may not have been the best way to test whether all children follow the same sequence of stage progression. His research was **cross-sectional**, meaning that he interviewed children of different ages to see what level of moral development they were at. A better way to see if all children follow the same order through the stages would have been to carry out longitudinal research on the same children. However, longitudinal research on Kohlberg's theory has since been carried out by Colby et al. (1983) who tested 58 male participants of Kohlberg's original study. She tested them six times in the span of 27 years and found support for Kohlberg's original conclusion, which we all pass through the stages of moral development in the same order.

2.7. Factors affecting Growth and Development

Nature and nurture both contribute to the growth and development of children. Although what's endowed by nature is constant, nurture tends to make a big difference too. Here are a few factors affecting children's growth and development.

Heredity

Heredity is the transmission of physical characteristics from parents to children through their genes. It influences all aspects of physical appearance such as height, weight, body structure, the colour of the eye, the texture of the hair, and even intelligence and aptitudes. Diseases and conditions such as heart disease, diabetes, obesity, etc., can also be passed through genes, thereby affecting the growth and development of the child adversely. However, environmental factors and nurturing can bring the best out of the already present qualities in the genes.

Environment

The environment plays a critical role in the development of children and it represents the sum total of physical and psychological stimulation the child receives. Some of the environmental factors influencing early childhood development involve the physical surroundings and geographical conditions of the place the child lives in, as well his social environment and relationships with family and peers. It is easy to understand that a well-nurtured child does better than a deprived one; the environment children

are constantly immersed in contributes to this. A good school and a loving family builds in children strong social and interpersonal skills, which will enable them to excel in other areas such as academics and extracurricular activities. This will, of course, be different for children who are raised in stressful environments.

Gender

The gender of the child is another major factor affecting the physical growth and development of a child. Boys and girls grow in different ways, especially nearing puberty. Boys tend to be taller and physically stronger than girls. However, girls tend to mature faster during adolescence, while boys mature over a longer period of time. The physical structure of their bodies also has differences which make boys more athletic and suited for activities that require physical rigor. Their temperaments also vary, making them show interest in different things.

Exercise and Health

The word exercise here does not mean physical exercise as a discipline or children deliberately engaging in physical activities knowing it would help them grow. Exercise here refers to the normal play time and sports activities which help the body gain an increase in muscular strength and put on bone mass. Proper exercise helps children grow well and reach milestones on time or sooner. Exercise also keeps them healthy and fights off diseases by strengthening the immune system, especially if they play outside. This is because outdoor play exposes them to microbes that help them build resistance and prevent allergies.

Hormones

Hormones belong to the endocrine system and influence the various functions of our bodies. They are produced by different glands that are situated in specific parts of the body to secrete hormones that control body functions. Their timely functioning is critical for normal physical growth and development in children. Imbalances in the functioning of hormone-secreting glands can result in growth defects, obesity, behavioural problems and other diseases. During puberty, the gonads produce sex hormones which control the development of the sex organs and the appearance of secondary sexual characteristics in boys and girls.

Nutrition

Nutrition is a critical factor in growth as everything the body needs to build and repair itself comes from the food we eat. Malnutrition can cause deficiency diseases that adversely affect the growth and development of children. On the other hand,

overeating can lead to obesity and health problems in the long run, such as diabetes and heart disease. A balanced diet that is rich in vitamins, minerals, proteins, carbohydrates and fats is essential for the development of the brain and body.

Familial Influence

Families have the most profound impact in nurturing a child and determining the ways in which they develop psychologically and socially. Whether they are raised by their parents, grandparents or foster care, they need basic love, care and courtesy to develop as healthy functional individuals. The most positive growth is seen when families invest time, energy and love in the development of the child through activities, such as reading to them, playing with them and having deep meaningful conversations. Families that abuse or neglect children would affect their positive development. These children may end up as individuals who have poor social skills and difficulty bonding with other people as adults. Helicopter parenting also has negative effects as they render children dependent on the parents' even as young adults and unable to deal with difficulties in life on their own

Geographical Influences

Where you live also has a great influence on how your children turn out to be. The schools they attend, the neighborhood they live in, the opportunities offered by the community and their peer circles are some of the social factors affecting a child's development. Living in an enriching community that has parks, libraries and community centres for group activities and sports all play a role in developing the child's skills, talents, and behaviour. Uninteresting communities can push some children to not go outside often but play video games at home instead. Even the weather of a place influences children in the form of bodily rhythms, allergies and other health conditions.

Socio-Economic Status

The socio-economic status of a family determines the quality of the opportunity a child gets. Studying in better schools that are more expensive definitely has benefits in the long run. Well-off families can also offer better learning resources for their children and they afford special aid if the kids need it. Children from poorer families may not have access to educational resources and good nutrition to reach their full potential. They may also have working parents who work too many hours and cannot invest enough quality time in their development.

Learning and Reinforcement

Learning involves much more than schooling. It is also concerned with building the child up mentally, intellectually, emotionally, and socially so they operate as healthy functional individuals in the society. This is where the development of the mind takes place and the child can gain some maturity. Reinforcement is a component of learning where an activity or exercise is repeated and refined to solidify the lessons learned. An example is playing a musical instrument; they get better at playing it as they practice playing the instrument. Therefore, any lesson that is taught has to be repeated until the right results are obtained.

Although nature contributes much to the growth and development of children, nurture contributes much more. As mentioned earlier, some of these factors may not be controllable, and you'll have to make do with what you have. But there are certain things you can definitely ensure for your child. This includes ensuring that your child gets enough rest every day, because his development is heavily dependent on the amount of sleep he gets. Pay close attention to your child's nutritional and exercise levels, as these too play an important role in promoting your child's timely and healthy growth and development.

2.8. Let Us Sum Up

- The term 'growth' and 'development' both represent the processes that result in changes in an organism right from the beginning of its life. However the term development is more comprehensive than growth as it is related to the overall changes, structural as well as functional, in all aspects of one's personality namely, physical, mental, emotional, social and moral taking place taking place right from conception to till death.
- The course of one's life from conception till death is divided into certain specific stages of growth and development namely, infancy, childhood, adolescence, adulthood and old age. Each of these stages chronologically extends over a rather definite period in years and is characterized by typical norms of behavioral characteristics which are specific to the particular stages in all the different dimensions of the make-up of one's personality.
- Moreover, development in general, from conception onward in various dimensions of one's personality ids found to follow some basic rules known as the principles of development. The knowledge of these principles of growth

and development proves quite useful to parents and teachers for ensuring the harmonious growth and development of the personalities of their children.

- Three major research methods have been discussed in this unit. They represent the most important kinds of investigation available to developmental psychologists such as cross-sectional study, the longitudinal study, and the Cohort study.
- In longitudinal studies, the researcher follows the same group of subjects through the various stages of development that are measured. If we found group of newborn babies who were available for month-by-month measure - aments, we could complete the study with repeated observations of this one group.
- The cross-sectional method of investigation often is used when the research aim is to compare developmental levels at various ages or backgrounds. Many children at different ages are studied in groups according to their age, and the results on the same sets of measures are compared for the groups. For example, the approximate age at which an infant can be expected to roll over, creep, crawl, pull himself up to a standing position, and walk unaided can be determined by observing the behaviour of groups of children from birth until the age of about 15 months. If we, as investigators, study a group of one- month-old infants, another group of two-month olds, and a different group of babies at every month of age thereafter, we will have a cross-sectional research design
- The cohort method is used in studies to describe an aggregate of individuals having in common a significant event in their life histories, such as year of birth (birth cohort) or year of marriage (marriage cohort) etc.
- Various theories have been put forward by different psychologists from time to time for tracing the developmental processes in one or the other dimension of one's personality.
- Piaget's theory of cognitive development identifies four distinct stages of children's intellectual development: sensory-motor, pre-operational, concrete-operational and formal operational (Discussed in details in this unit). A child's cognitive abilities develop as he progresses from stage to stage. For example, in the concrete operation stage he/she begins to think logically but is unable to think abstractly, during the formal operational stage, he /she begin to think abstractly and deal with problems that are not physically present.

- Vygotsky's Sociocultural Perspective states that what are three main influences on cognitive development? Vygotsky believed that human activities must be understood in their cultural settings. He believed that our specific mental structures and processes can be traced to our interactions with others; that the tools of the culture, especially the tool of language, are key factors in development; and that the zone of proximal development is the area where learning and development are possible.
- Kohlbere's Theory of Moral development relates an individual's development to his cognitive development. Kohlberg identified three levels of moral development: premoral (4 to 10 years), conventional morality (10 to 13 years) and self-accepted moral principles (age 13 or sometime afterwards). Each of these levels was described to consist of two stages. In this way he tried to describe moral development as a function of the development of one's sense of justice evolving progressively through the six stages covered at the three levels of morality at different periods of one's life. He also asserted that many of us are not able to cross the second level of moral development. T herein lies the varying individual perception in terms of the quality and level of morality depending upon cognitive development as well as on upbringing and social experiences.
- The factors influencing a person's growth and development may be classified as internal factors and external factors. The internal factors (lying within the individual) may include hereditary factors, biological factors, intelligence, emotional make-up and social nature. The external factors may be traced in a person's environment right from conception and, therefore, it may be categorized as the environment available in the mother womb (internal environment) and environment available after birth (external environment) for a child's growth and development.

2.9. Unit End Exercise

1. What do you mean by growth and development?
2. What are the differences between growth and development?
3. Write any two characteristics of development.
4. Write any two principles of development.

5. What is longitudinal study?
6. Mention any two uses of longitudinal study.
7. What is cross-sectional study?
8. Why cohort study is important in the study of human development?
9. What is schema according to Piaget?
10. What is accommodation in the cognitive developmental theory of Piaget?
11. What do you mean by morality?
12. What is Zone of Proximal Development?
13. Describe the role of culture in cognitive development.
14. Explain the role of environment in growth and development
15. Describe the role of heredity in growth and development.

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Unit - 3 □ Cognition and Information Processing

Structure

3.1 Introduction

Educators are very interested in the study of how human learns. This is because how one learns, acquires new information, and retains acquired information, guides selection of long-term learning objectives and methods of effective instruction. To this end, cognition as a psychological area of study goes far beyond simply the taking in and retrieving information. It is a broad field dedicated to the study of the mind holistically. Neisser (1967), one of the most influential researchers in cognition, defined it as the study of how people encode, structure, store, retrieve, use or otherwise learn knowledge. Cognitive psychologists hypothesize an intervening variable or set of variables between environment and behavior—which contrasts it with behavioral theories.**Cognitive psychology** is the field of psychology dedicated to examining how people think. It attempts to explain how and why we think the way we do by studying the interactions among human thinking, emotion, creativity, language, and problem solving, in addition

to other cognitive processes. Cognitive psychologists strive to determine and measure different types of intelligence, why some people are better at problem solving than others, and how emotional intelligence affects success in the workplace, among countless other topics.

Cognition is a term referring to the mental processes involved in gaining knowledge and comprehension. These processes include thinking, knowing, remembering, judging and problem-solving. These are higher-level functions of the brain and encompass language, imagination, perception, and planning.

Cognition and its development have been studied from many viewpoints and subjected to many interpretations. The essence of cognition is judgment, which occurs when a certain object is distinguished from other objects and is characterized by some concept or concepts. The psychologist is concerned with cognitive processes as they affect learning and behaviour.

There are two broad approaches to contemporary cognitive theory. The information-processing approach attempts to understand human thought and reasoning processes by comparing the mind (or the brain) to a sophisticated computer system that is designed to acquire, process, store, and use information in specific ways. The American psychologist Robert Sternberg, for example, examined the information-processing procedures used by people taking intelligence tests. Herbert A. Simon, another American social scientist, attempted to understand how the mind processes information, programming computers to mimic human thought processes. Researchers in this area strive to develop a unified theory of cognition by creating computer programs that can learn, solve problems, and remember as humans do. The second approach is based on the work of Swiss psychologist Jean Piaget, who viewed cognitive adaptation in terms of two basic processes: assimilation and accommodation. Assimilation is the process of interpreting reality in terms of a person's internal model of the world (based on previous experience); accommodation represents the changes one makes to that model through the process of adjusting to experience. The American psychologist Jerome S. Bruner broadened Piaget's concept by suggesting that cognitive processes are influenced by the three modes that are used to represent the world: the **enactive mode** involves representation through action; the **iconic mode** uses visual and mental images; and the **symbolic mode** uses language.

3.2 Objectives

After reading this unit, you will be able to:

- Know about sensation, perception and attention
- About memory, its nature and its effect
- Thinking, concept formation, reasoning and problem solving
- Describe theories of intelligence, assessment of intelligence
- About creativity
- Individual differences and its implications for children with disabilities

3.3 Sensation, Perception and Attention

The importance of sense organs in the behaviour of a living organism can hardly be exaggerated. Sense organs are like the doors through which the organism becomes aware of his environment. As we go up the evolutionary stage, sensory mechanisms become more varied and more sensitive. The human organism seems to be well equipped to register his world. The senses provide us with the knowledge of things with which we deal.

In fact, it is impossible to think of behaviour without sense organs as it is impossible to think of it without the brain and the nervous system. At every moment of our life, right from the time we are born till we are dead, we are responding to the physical world around us and to various conditions within our body through the action of our senses.

Our sense organs then, make us aware of our external world as well as the internal processes in our body. The famous British Philosopher John Locke said many years ago that, "there is nothing in our mind that was not first in our senses."

Sensation involves the relay of information from sensory receptors to the brain and enables a person to experience the world around them. Sensation and perception are two separate processes that are very closely related. Sensation is input about the physical world obtained by our sensory receptors, and perception is the process by which the brain selects, organizes, and interprets these sensations. In other words, senses are the physiological basis of perception. Perception of the same senses may

vary from one person to another because each person's brain interprets stimuli differently based on that individual's learning, memory, emotions, and expectations.

THE SENSES

There are five classical human senses: sight, sound, taste, smell, and touch. Two other senses, kinesthesia and the vestibular senses, have become widely recognized by scientists. Kinesthesia is the perception of the positioning of the parts of the body, commonly known as "body awareness." Vestibular senses detect gravity, linear acceleration (such as speeding up or slowing down on a straight road), and rotary acceleration (such as speeding up or slowing down around a curve). Both kinesthesia and the vestibular senses help us to balance.

Sensory information (such as taste, light, odor, pressure, vibration, heat, and pain) is perceived through the body's sensory receptors. These sensory receptors include the eyes, ears, mouth, nose, hands, and feet (and the skin as a whole). Rod and cone receptors in the retina of the eye perceive light; cilia in the ear perceive sound; chemical receptors in the nasal cavities and mouth perceive smell and taste; and muscle spindles, as well as pressure, vibration, heat and pain receptors in the skin, perceive the many sensations of touch.

Specialized cells in the sensory receptors convert the incoming energy (e.g., light) into neural impulses. These neural impulses enter the cerebral cortex of the brain, which is made up of layers of neurons with many inputs. These layers of neurons in the function like mini microprocessors, and it is their job to organize the sensations and interpret them in the process of perception.

SENSORY ADAPTATION

An important characteristic in the working of our senses is that they get gradually adapted to continual stimulation. In general, it is true that all senses gradually become less sensitive as they are continually stimulated and more sensitive in the absence of any stimulation. For example, when wearing clothes, our skin senses feel their pressure but soon we become unaware of it because our skin senses: have adapted to the pressure of the clothes.

By the same token, in extreme darkness we are able to detect even a faint glimmer of light because there is complete absence of visual stimulation. These changes brought

about in our receptor organs either due to their continual stimulation or absence of stimulation are referred to as the phenomenon of adaptation. There are varying degrees of adaptation in different sense modalities.

PERCEPTION

FIGURE AND GROUND

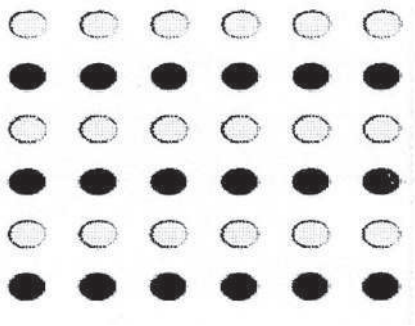
Imagine, if figure-ground segregation was not there how confusing the world would have been for us. Perhaps, perceptual organization would not be possible. For example, see figure 5.1 in which the random shape stands out as a figure and page becomes back ground. Another example, whatever is written on the black-board by your teacher becomes "figure" and the black board becomes a "ground". You cannot read anything on the blackboard until and unless the figure (words) is segregated from the back ground (black-board). In our visual field (whatever we look out in the environment around us) some area is segregated to form figures and the rest is relegated to the background (that part which is not important for us) against which the figures are perceived. Figure-ground segregation is essential for the perception of shape. It is not only the characteristics of visual perception; it is there in all sense modalities. For example, when you listen to the music, the vocal part of the music (what a singer sings) becomes figure and the instrumental part is relegated to the background. If the listener is interested in the instrumental part ("figure") of the music then the vocal part becomes "ground".

DETERMINANTS OF PERCEPTION

The Gestalt psychologists in Germany, principally Kohler, Koffka, and Wertheimer, proposed that the brain has the innate capacity for organizing perceptions. They identified the laws of organization which determine the way in which we perceive the objects. They maintain that electrical fields in the brain are responsible for the organization of perception. They were also interested in exploring figure-ground distinction, what makes figures stand out against a background.

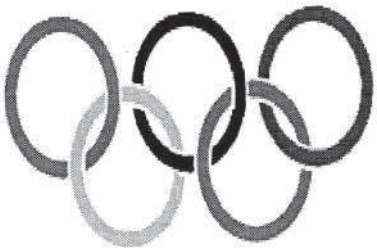
LAWS OF SIMILARITY

The law of similarity suggests that things similar things tend to appear grouped together. Grouping can occur in both visual and auditory stimuli. In the image above, for example, you probably see the groupings of colored circles as rows rather than just a collection of dots.



LAW OF PRAGNANZ

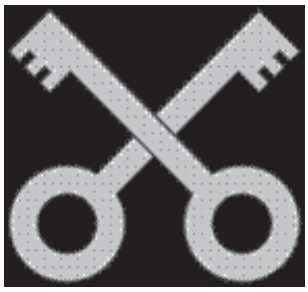
The word *pragnanz* is a German term meaning "good figure." The law of Pragnanz is sometimes referred to as the law of good figure or the law of simplicity. This law holds that objects in the environment are seen in a way that makes them appear as simple as possible.



LAW OF PROXIMITY

According to the law of proximity, things that are near each other seem to be grouped together.[4]ÿþ In the above image, the circles on the left appear to be part of one grouping while those on the right appear to be part of another. Because the objects are close to each other, we group them together.

LAW OF CONTINUITY



The law of continuity holds that points that are connected by straight or curving lines are seen in a way that follows the smoothest path. Rather than seeing separate lines and angles, lines are seen as belonging together.

LAW OF CLOSURE

According to the law of closure, things are grouped together if they seem to complete some entity. Our brains often ignore contradictory information and fill in gaps in information. In the image above, you probably see the shapes of a circle and rectangle because your brain fills in the missing gaps in order to create a meaningful image.

PERCEPTUAL CONSTANCY:

This refers to stableness in perception. We have a tendency to perceive the objects as relatively stable and unchanging in shape and size, in spite of a change in the image that we receive. For example, when we see a person from 52 distance, the size of the image in our eyes differs from the image of the same person from 1002 distance.

TYPES OF PERCEPTUAL CONSTANCY:

There are different types of perceptual constancies. They are shape and size, brightness and colour, size constancy, etc.

DEPTH PERCEPTION:

Ability of a person to perceive the distance is known as depth perception. This is very important ability to judge the distance between us and other people, objects and

vehicles moving particularly when we are on roads. This is also known as third dimension. The other two dimensions are left and right, and above and below.

CUES:

Depth perception is possible due to certain cues. These cues help us to understand the distance between one person and the other person or object.

These are of two types:

A. MONOCULAR CUES:

These are the cues that can operate when only one eye is looking. Some of such cues are:

LINEAR PERSPECTIVE:

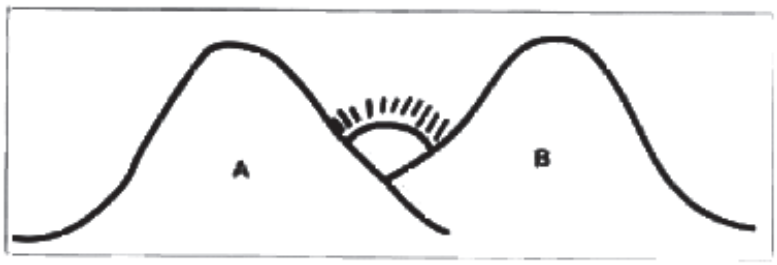
The distances separating the images of far objects appear to be smaller. For example, imagine that you are standing between railway tracks and looking off into the distance. It appears that the tracks would seem to run closer and closer together at the other end.

AERIAL PERSPECTIVE:

The nearer objects appear clearer than the distant objects. For example, a hill in far of distance appears farther away because the details do not seem clearly.

INTERPOSITION:

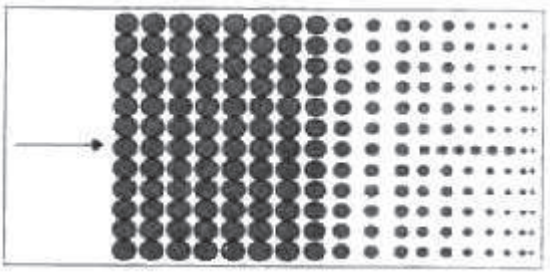
When one object obstructs our view of another, the front one appears nearer than the partly covered one. For example, in the figurethe hill which appears full is definitely nearer than the partly seen.



GRADIENT STRUCTURE:

A gradient is a continuous change in something- a change without abrupt transitions. Usually the regions closer to the observer have a coarse texture and many details. As the distance increases, the texture becomes finer and finer.

This happens very gradually and gives a cue about the depth or distance. In Figure 3.9 the structures which are nearer appear larger than the distant one which appear smaller as the move away.



There are some other monocular cues also viz., movement, shadow, etc.

B. BINOCULAR CUES:

Sometimes the depth can be perceived when both eyes are used. This is called binocular cue. There are 2 binocular cues:

1. RETINAL DISPARITY:

The image of the object which falls on both the retinas differs. Disparity will be more when the object is closer than when it is far away. Depending upon the correspondence between the distance and the amount of disparity, the depth can be perceived.

2. CONVERGENCE OR DIVERGENCE OF EYEBALLS:

When the object moves nearer and nearer to our eyes, our eyeballs converge, and as the object moves away from us the eyeballs diverge. This process acts as a binocular cue to perceive the depth.

PERCEPTION OF MOVEMENT:

When a particular object appears in different places at different times we understand that the object is in movement. This process is called perception of movement. Such an ability to perceive movement is gained from birth itself as a natural process.

This is a most important ability. It is only by this ability the organism can understand the world around and can perceive the dangers / threats in the movement, so that it can easily escape from such dangers.

APPARENT MOTION:

Sometimes we perceive that the objects are moving. In fact the objects are stationary, i.e. they will not be moving. Hence the perception of an object which is not moving, as an object moving is an illusion. For example, when we are moving fast in a bus, the trees, plants and other non-moving objects appear to move in the opposite direction.

In the same way, even the movements of figures in a film appear to move, though they remain without movement. Since moving pictures are taken continuously and the film reel is run very fast, it produces a movement feeling called stroboscopic motion or phi phenomenon.

FACTORS AFFECTING PERCEPTION:

There are individual differences in perceptual abilities. Two people may perceive the same stimulus differently.

THE FACTORS AFFECTING THE PERCEPTIONS OF PEOPLE ARE:

A. PERCEPTUAL LEARNING:

Based on past experiences or any special training that we get, every one of us learns to emphasize some sensory inputs and to ignore others. For example, a person who has got training in some occupation like artistry or other skilled jobs can perform better than other untrained people. Experience is the best teacher for such perceptual skills.

For example, blind people identify the people by their voice or by sounds of their footsteps.

B. MENTAL SET:

Set refers to preparedness or readiness to receive some sensory input. Such expectancy keeps the individual prepared with good attention and concentration. For example, when we are expecting the arrival of a train, we listen to its horn or sound even if there is a lot of noise disturbance.

C. MOTIVES AND NEEDS:

Our motives and needs will definitely influence our perception. For example, a hungry person is motivated to recognize only the food items among other articles. His attention cannot be directed towards other things until his motive is satisfied.

D. COGNITIVE STYLES:

People are said to differ in the ways they characteristically process the information. Every individual will have his or her own way of understanding the situation. It is said that the people who are flexible will have good attention and they are less affected by interfering influences and to be less dominated by internal needs and motives than or people at the constricted end.

EXTRASENSORY PERCEPTION (ESP):

Is there any way of knowing about the world in which the information does not come through the senses? Some people believe that is possible. But there are some instances reported by people that they have experienced some perceptions without the aid of their sense organs. Psychologists have named the perception that occurs without sensory stimulation as 'Extrasensory perception' (ESP).

This is otherwise known as sixth sense in common man's view. Some of the common phenomena in ESP are clairvoyance, telepathy, meeting the souls, precognition, psycho-kinesis, reincarnation, etc.

ERRORS IN PERCEPTION:

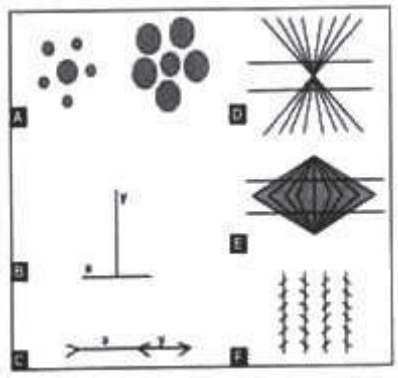
As seen above perception is process of analyzing and understanding a stimulus as it is. But it may not be always possible to perceive the stimuli as they are. Knowingly or unknowingly, we mistake the stimulus and perceive it wrongly.

It may be due to defect in our sense organs or defective functioning of the brain. Many times the prejudices in the individual, time of perception, unfavorable background, lack of clarity of stimulus, confusion, conflict in mind and such other factors are responsible for errors in perception. There are two kinds of errors:

A. ILLUSION:

Illusion is a false perception. Here the person will mistake a stimulus and perceive it wrongly. For example, in the dark, a rope is mistaken as a snake or vice versa. The voice of an unknown person is mistaken as a friend's voice. A person standing at a distance who is not known may be perceived as a known person.

Most of our illusions are visual and auditory. But illusions pertaining to other senses are also possible. See figure for some of the examples of visual illusions.



B. HALLUCINATION:

Sometimes we come across instances where the individual perceives some stimulus, even when it is not present. This phenomenon is known as hallucination. The person may see an object, person, etc. or he may listen to some voice though there are no objects and sounds in reality.

Hallucinations pertain to all the sensations appear in people, but visual and auditory hallucinations are more common. Usually persons with unsound mind, emotionally disturbed, alcoholics and those who are in confused states may experience hallucinations. However, among abnormal people and intoxicated persons hallucinations are very common.

ATTENTION

We use the word 'attention' frequently in our day to day life. During lectures in classroom, a teacher calls for your attention to what he is saying or what he is writes on the blackboard. Attention is a concept studied in cognitive psychology that refers to how we actively process specific information in our environment.

Attention is awareness of the here and now in a focal and perceptive way. For early psychologists, such as Edward Bradford Titchener, attention determined the content of consciousness and influenced the quality of conscious experience. In subsequent years less emphasis was placed on the subjective element of consciousness and more on the behaviour patterns by which attention could be recognized in others. Although human experience is determined by the way people direct their attention, it is evident that they do not have complete control over such direction. There are, for example, times when an individual has difficulty concentrating attention on a task, a conversation,

or a set of events. At other times an individual's attention is "captured" by an unexpected event rather than voluntarily directed toward it.

Attention has to do with the immediate experience of the individual; it is a state of current awareness. There are, of course, myriad events taking place in the world all the time, each impinging upon a person's senses. There are also events taking place within the body that affect attention, just as there are representations of past events stored in one's memory but accessible to awareness under appropriate circumstances. Let us considered a few definitions to understand the proper meaning of this word.

Dumville (1938)

Attention is the concentration of consciousness upon one subject rather than upon another.

Ross (1951)

Attention is the process of getting an object of thought clearly before the mind.

Morgan & Gilliland (1942)

Attention is being keenly alive to some specific factor in our environment. It is a preparatory adjustment for response.

The following characteristics of attention can be taken into consideration:

1. Attention is essentially a process, and not a product.
2. It helps in our awareness or consciousness of our environment.
3. This awareness or consciousness is selective.
4. At any one time, we can concentrate or focus our consciousness on one particular object only.
5. The concentration or focus provided by the process of attention helps us in the clear understanding of the perceived object or phenomenon.
6. In the chain of the stimulus-response behavior it works as a mediator. Stimuli, which are given proper attention yield better response. Therefore, for providing an appropriate response, one has to give proper attention to the stimulus to reach the stage of preparedness or alertness which may be required.
7. Attention is not merely a cognitive function but is essentially determined by emotional and conative factors of interest, attitude and striving.

SELECTIVENESS OF ATTENTION

Psychologists have propounded some theories or models or attention to properly answer this question. Broadly these can be divided into two categories-an early selection theory of attention like the Filter theory and the late selection theories.

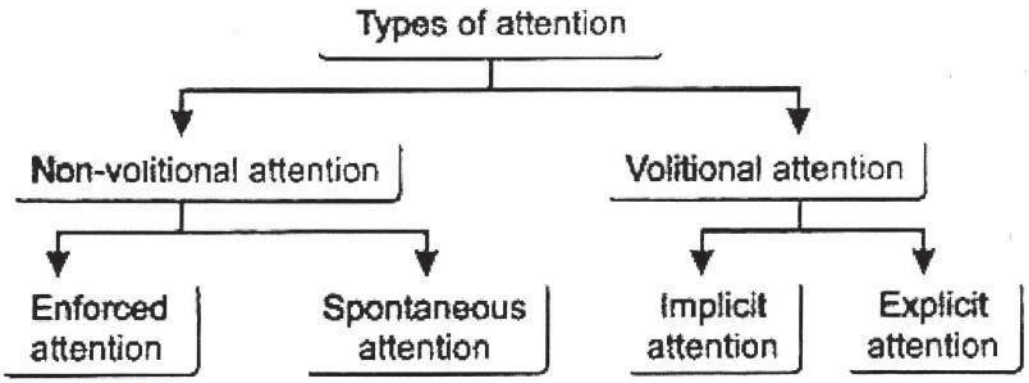
The filter theory put forward by Donald Broadbent (1957, 1958) postulated the existence of two general systems-the sensory and the perceptual. Many signals from the environment can be registered simultaneously in the sensory system. In order, however, to make it possible for the perceptual system to attend only to one signal and ignore all others, that is roughly equivalent to conscious attention, the sensory system filters out all unimportant signals before they can reach the perceptual system. As a result of this filtration, extraneous and non-essential signals are excluded from interfering with the selected signals. Since the signal for attention is selected in the initial stages of the process, the filter theory is considered as one of the early selection theories of attention.

The late selection theories e.g., those of Norman (1968) and Schneider and Shiffrin (1977) assert that ignored information is not filtered out at a sensory level. Instead the information is processed through early stages of perception, and attention to one signal occurs much later, just before conscious awareness. Emphasizing the point further, these theories maintain that although people may still not be conscious of the different signals at that point, some kind of decision making opens the door to consciousness for the most important or expected signal by ignoring the others.

TYPES OF ATTENTION

Various authors have classified attention in a variety of ways. The classification given by Ross (1951) which seems to be the more acceptable.

According to him attention is branched with:



(A) NON-VOLITIONAL OR INVOLUNTARY ATTENTION:

This type of attention is aroused without the play of will. Here we attend to an object or condition without making any conscious effort, e.g. a mother's attention towards her crying child, for example, attention towards the members of the opposite sex, and towards bright colours, etc. The attention which is aroused by the instincts is called "enforced non-volitional attention". A young man when we remark on his sex instinct or his curiosity, he becomes quite attentive in his task.

B) VOLITIONAL OR VOLUNTARY ATTENTION:

When the 'exercised will' is called upon, it becomes volitional attention. Because it demands the conscious efforts on our part it is least automatic and spontaneous like that of non-volitional attention. Attention payed at the time of solving an assigned problem of mathematics, answering question in an examination hall and so on comes under volitional attention category.

VOLITIONAL ATTENTION IS FURTHER SUBDIVIDED INTO TWO CATEGORIES:

i. A single act of volition is sufficient to bring about attention in the case of implicit attention, e.g. for single act of will can arouse attention.
ii. In explicit volitional attention we need repeated acts of will to sustain it, e.g. here attention is obtained by repeated acts of will.

DETERMINANTS OF ATTTENTION

1. External factors or condition
2. Internal factors

I. EXTERNAL FACTORS OR CONDITION:

These conditions are generally those characteristics of outside situation or stimuli which make the strongest aid for capturing our attention.

THESE CAN BE CLASSIFIED AS:

1. NATURE OF THE STIMULUS:

All types of stimuli are not able to bring the same degree of attention. A picture attracts attention more readily than words. Among the pictures, the pictures of human beings invite more attention and those of human beings related to beautiful women or handsome men, who attract more attention. In this way an effective stimulus should always be chosen for capturing maximum attention.

2. INTENSITY AND SIZE OF THE STIMULUS:

In comparison with the weak stimulus, the immense stimulus attracts more attention of an individual. Our attention become easily directed towards a loud sound, a bright light or a strong smell, and also a large building will be more readily attended to, than a small one.

3. CONTRAST, CHANGE AND VARIETY:

Change and variety strike attention more easily than sameness and absence of change, e.g. we do not notice the ticking sound of a clock put on the wall until it stops ticking, that is any change in the attention to which you have been attracted immediately capture your attention. The factor, contact or change is highly responsible for capturing attention of the organism and contributes more than the intensity, size or nature of the stimulus.

4. REPETITION OF STIMULUS**:**

Repetition is the factor of great importance in securing attention. Because one may ignore a stimulus at first instance, but if it is repeated for several times it captures our attention, e.g. a miss-spelled word is more likely to be noticed, if it occurs twice in the same paragraph than, if it occurs only once. While giving lecture the important aspects of the speech are often repeated so that the attention of the audience can be easily directed to the valuable points.

5. MOVEMENT OF THE STIMULUS:

The moving stimulus catches our attention more quickly than a stimulus that does not move. We are more sensitive to objects that move in our field of vision, e.g. advertisers make use of this fact and try to catch the attention of people through moving electric lights.

DURATION AND DEGREE OF ATTENTION:

People may possess the ability to grasp a number of objects or in other words, to attend a number of stimuli in one short “presentation”. This ability of an individual is evaluated in terms of the span of attention, which differs from person to person and even situation to situation.

The term “span of attention” is designed in terms of the quality, size extent to which the perceptual field of an individual can be effectively organized in order to enable him to attain a number of things in a given spell of short duration.

II. INTERNAL OR SUBJECTIVE FACTORS:

These factors predispose the individual to respond to objective factors, to attend to those activities that fulfill his desires and motives and suit his interest and attitude. It is the mental state of the perceiver.

SOME OF THE SUBJECTIVE FACTORS ARE:

1. INTEREST:

Interest is said to be the mother of attention. We attend to objects in which we have interest. We would like to watch a movie or a serial in TV because we are interested in the subject around which the movie or serial revolves. In any get-together if any subject of our interest is discussed that attracts our attention easily and makes us to participate in the discussion. In our day-to-day life we pay attention to the stimulus we are interested in.

2. MOTIVES:

Our basic needs and motives to a great extent determine our attention, thirst, hunger, sex, curiosity, fear are some of the important motives that influence attention, e.g. small children get attracted towards eatables.

3. MIND SET:

Person's readiness to respond determines his attention. If we are expecting a stimulus, occurrence of that stimulus along with many other stimuli may not come in the way of attending to that particular stimulus. At a time when students are expecting the examination time table by the end of the semester the time table put out on the notice board along with other notices would attract their attention easily.

4. MOODS AND ATTITUDES:

What we attend to is influenced by the moods and attitudes. When we are disturbed or in angry mood, we notice the smallest mistake of others very easily. Likewise our favorable and unfavorable attitudes also determine our attention. After discussing subjective and objective factors, we realize that these factors are interrelated. How much or in what way we attend to a stimulus depends on subjective as well as objective factors.

SPAN OF ATTENTION

While defining attention, we emphasized that in a strict psychological seen only one object, idea, or fact can be the centre of consciousness at one particular moment and

consequently we can attend to only one thing at a time. However, it is found with some people that they can attend to more than one or even many tasks at the same time. While writing a letter they are seen attending to the telephone, keeping track of the time on the wall clock and responding to the approach of somebody else. In other cases, immediately after entering a room or a hall, some individuals are able to give a detailed account of the number of chairs and fans, persons present, the pictures on the walls, the colour of the walls or curtains etc. In this way, they may possess the ability to grasp a number of things, or in other words attend to a number of stimuli in one short exposure. This ability of an individual is evaluated in terms of the span of his attention which varies from person to person and even situation to situation in the same person. Therefore, the term 'span of attention' may be defined as the quality, size or extent to which the perceptual field of an individual can be effectively organized in order to enable him to attend to a number of things in a given spell of short duration.

SHIFTING OR FLUCTUATION OF ATTENTION

While paying attention to an object, event or phenomenon, it is not possible for us to hold it continuously with the same intensity for a long duration. In the course of time, the centre of our consciousness either shifts from one stimulus to another or from one part of the same stimulus to another part. This is called the shifting or fluctuation of attention. Fluctuation of attention also involves rapid change in the intensity of attention. The intensity increases or decreases, ranging between the paying of attention, not paying of attention, and paying least or less attention.

The reason for the shifting of attention and fluctuation of our attention lies in the division of the field of perception or consciousness at a particular moment. Consciousness at a particular moment may be divided into two parts, central and marginal. At the time when our attention is on the wall clock and consciousness is focused on it, the other objects and activities going on inside the room remain within the reach of marginal consciousness. This helps us in being partly conscious or aware over them. Both these fields of perception or consciousness are interchangeable. An object of attention at a given moment, may shift to marginal consciousness or even beyond. Consequently the focus of attention generally keeps changing thus making the process of attention flexible and dynamic.

3.4 Memory-nature And Types, Factors Affecting Memory

Learning occupies a very significant place in one's life. It is the basis not only of the development and progress of human society but also of its survival. Learning, however,

would be futile if its products cannot be utilized by us in the future. Whatever is learned needs in the future. Whatever is learned needs to be somehow stored in the mind so that it can be utilized whenever required in the future. In psychological terms, this faculty of the mind to store the past experiences or learning and to reproduce them for use when required at a later time as 'memory'. Ryburn (1956) endorses this meaning of memory in the following words:

"The power that we have to 'store' our experiences, and to bring them into the field of our consciousness some time after the experiences have occurred, is termed *memory*".

NATURE OF MEMORY

Memory is the process of retaining information over time. It occurs in three different phases (or stages). The first phase of memory is called Memory Encoding. It is the process of getting, or taking in, information. The second phase of memory is called Memory Storage. It is the process of keeping encoded information intact. Lastly, the third phase of memory is called Memory Retrieval. It is the process of remembering stored information as outputs. The quality and quantity of retrieved information are significant factors used to evaluate the strength of a person's memory.

The importance of memory, perhaps, lies in how much we depend on it for us to carry out our daily tasks. For example, it takes a lot of experience and information about physical dimensions in order to wash the dishes. Additionally, it takes a lot of language exposure and vocabulary to follow instructions from your mother. Looking at memory this way, it is amazing how much information we actually take in every day. For example, in a single day, you must have retained information about what you did, why you did them, whom you talked to, where you went, what clothes you wore, and even how you carried out certain activities. Additionally, you might have picked up a few concepts, names, or even dates, from a book chapter you just read.

Our mind possesses a special ability, by virtue of which every experiences or learning leaves behind memory images or traces which are conserved in the form of 'engrams'. Thus what is learned leaves its after-effect which is conserved in the forms of engrams composed of memory traces. This preservation of the memory traces by central nervous system or brain is known as retention of the learned or experienced act. The duration of retention depends upon th1e strength and quality of the memory traces. When we try to recollect or repeat our past experiences or learning, we make use of the memory traces and if we are successful in the revival of our memory traces, our memory is said to be good. But if, somehow or the other, the memory traces have died out, we cannot reproduce or make use of our past experiences and learning. In this case it is said that we have been unable to retain what has been learned or that we have forgotten.

Learning is then the primary condition for memorization. If there is no learning there would be no remembering. At the second stage we have to ensure that these learning experiences are retained properly in the form of mental impressions or images so that they can be retrieved when the need arise. The third and fourth stages in the process of memorization can be termed as recognition and recall.

TYPES OF MEMEORY

Psychologists have tried to classify memory into certain types according to its nature and the purpose it serves.

One of the broad classifications consisting of sensory or immediate memory, short term memory and long term memory is based on the storage and transfer model of remembering.

SENSORY MEMORY

Sensory memory is the memory that helps an individual to recall something immediately after perceived. In this type of memory, the retention time is extremely brief-generally from a fraction of a second to several seconds. Old sensory impressions disappear as they are 'erased' by few seconds. **Sensory memory** is the shortest-term element of memory. It is the ability to retain impressions of sensory information after the original stimuli have ended. It acts as a kind of **buffer** for stimuli received through the **five senses of** sight, hearing, smell, taste and touch, which are retained accurately, but very briefly. For example, the ability to look at something and remember what it looked like with just a second of observation is an example of sensory memory.

Sensory memory is an ultra-short-term memory and **decays** or degrades very quickly, typically in the region of 200 – 500 milliseconds (1/5 – 1/2 second) after the perception of an item, and certainly less than a second (although echoic memory is now thought to last a little longer, up to perhaps three or four seconds). Indeed, it lasts for such a short time that it is often considered part of the process of **perception**, but it nevertheless represents an essential step for storing information in short-term memory.

The sensory memory for visual stimuli is sometimes known as the **iconic memory**, the memory for aural stimuli is known as the **echoic memory** and that for touch as the **haptic memory.** Smell may actually be even more closely linked to memory than the other senses, possibly because the **olfactory bulb** and **olfactory cortex** (where smell sensations are processed) are physically very close – separated by just 2 or 3 synapses – to the **hippocampus** and **amygdala** (which are involved in memory processes). Thus, smells may be more quickly and more strongly associated with

memories and their associated emotions than the other senses, and memories of smell may persist for longer, even without constant re-consolidation.

Experiments by **George Sperling** in the early 1960s involving the flashing of a grid of letters for a very short period of time (50 milliseconds) suggest that the upper limit of sensory memory (as distinct from short-term memory) is approximately **12 items**, although participants often reported that they seemed to "see" more than they could actually report.

Information is passed from the sensory memory into short-term memory via the process of **attention** (the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things), which effectively filters the stimuli to only those which are of interest at any given time.

SHORT TERM MEMORY

Often in daily life situations we need to recall material immediately or after a very short time. When we go to a new city we have to remember the names of different streets and persons or telephone numbers of officials whom we want to contact. Ass these situation are the examples of short term memory. Short term memory is also known as the working memory. It is the information we are currently aware of or thinking about. The information found in short-term memory comes from paying attention to sensory memories.

Most of the information kept in short-term memory will be stored for approximately 20 to 30 seconds, but it can be just seconds if rehearsal or active maintenance of the information is prevented. Some information can last in short-term memory for up to a minute, but most information spontaneously decays quite quickly.

For example, imagine that you are trying to remember a phone number. The other person rattles off the phone number, and you make a quick mental note. Moments later you realize that you have already forgotten the number. Without rehearsing or continuing to repeat the number until it is committed to memory, the information is quickly lost from short-term memory.

You can increase the duration of short-term memories to an extent by using rehearsal strategies such as saying the information aloud or mentally repeating it. However, the information in short-term memory is also highly susceptible to interference. Any new information that enters short-term memory will quickly displace any old information. Similar items in the environment can also interfere with short-term memories.

The amount of information that can be stored in short-term memory can vary. An often-cited figure is a plus or minus seven items, based on the results of a famous experiment on short-term memory.

In an influential paper titled "The Magical Number Seven, Plus or Minus Two," psychologist George Miller suggested that people can store between five and nine items in short-term memory. More recent research suggests that people are capable of storing approximately four chunks or pieces of information in short-term memory.

LONG TERM MEMORY

Psychologists think of long term memory (LTM) as a store-house where information is stored fairly permanently when we are not recalling it. Long-term memory (LTM) the final stage of the multi-store memory model proposed by the Atkinson-Shiffrin, providing the lasting retention of information and skills. Theoretically, the capacity of long-term memory could be unlimited, the main constraint on recall being accessibility rather than availability. Duration might be a few minutes or a lifetime. Suggested encoding modes are semantic (meaning) and visual (pictorial) in the main but can be acoustic also. Short -term memories can become long-term memory through the process of consolidation, involving **rehearsal** and **meaningful association**. Unlike short-term memory (which relies mostly on an **acoustic,** and to a lesser extent a **visual,** code for storing information), long-term memory encodes information for storage **semantically** (i.e. based on meaning and association). However, there is also some evidence that long-term memory does also encode to some extent by **sound.** For example, when we cannot quite remember a word but it is "on the **tip of the tongue**", this is usually based on the sound of a word, not its meaning.

TYPES OF LONG TERM MEMORY

Long-term memory is usually divided into two types — declarative (explicit) memory and non-declarative (implicit) memory.

Explicit memories, also known as declarative memories, include all of the memories that are available in consciousness. Explicit memory can be further divided into episodic memory (specific events) and semantic memory (knowledge about the world).

Implicit memories are those that are mostly unconscious. This type of memory includes **proceduralmemory,** which involves memories of body movement and how to use objects in the environment. How to drive a car or use a computer are examples of procedural memories.

One of the earliest and most influential distinctions of long-term memory was proposed by Tulving (1972). He proposed a distinction between episodic, semantic and procedural memory.

Procedural memory

Procedural memory is a part of the long-term memory is responsible for knowing how to do things, i.e. memory of motor skills.

It does not involve conscious (i.e. it's unconscious - automatic) thought and is not declarative. For example, procedural memory would involve knowledge of how to ride a bicycle.

SEMANTIC MEMORY

Semantic memory is a part of the long-term memory responsible for storing information about the world. This includes knowledge about the meaning of words, as well as general knowledge.

For example, New Delhi is the capital of India. It involves conscious thought and is declarative.

The knowledge that we hold in semantic memory focuses on "knowing that" something is the case (i.e. declarative). For example, we might have a semantic memory for knowing that Dhaka is the capital of Bangladesh.

EPISODIC MEMORY

Episodic memory s a part of the long-term memory responsible for storing information about events (i.e. episodes) that we have experienced in our lives.

It involves conscious thought and is declarative. An example would be a memory of our 1st day at school.

The knowledge that we hold in episodic memory focuses on "knowing that" something is the case (i.e. declarative). For example, we might have an episodic memory for knowing that we caught the bus to college today.

FACTORS AFFECTING MEMORY

Our brain is not hard-wired. Our state of mind, emotional content of experiences, and the environment in which a memory event happens all affect how, how strong, and how long we remember an experience.

Every experience leaves its mark physiologically on the neural network. Memory is strengthened or weakened by neuronal connections participating in the memory event. Even though certain memories are processed in certain areas of the brain, they are subject to modiûcation by new experiences.

Also, as neurons die or are used for other circuits, the clarity, deûnition and intensity of some memories may fade

BRAIN FUNCTIONING

Our ability to transform and consolidate new experiences into long-term memory requires normal functioning of brain structures that include the hippocampus, the medial temporal lobes, the thalamus, and their connections to other structures.

The hippocampus is critical for encoding information into memory. The amygdala, which provides emotional context to sensory input, colors our memories with feeling.

Memories of faces and objects seem to be processed in the temporal lobes, landscapes and patterns in the parietal lobes, and social encounters in the frontal lobes.

The cortex links elements of memories, making them part of our integrated memory experience. It is here that memories long buried, even those beyond conscious recall, can be triggered with all their richness of sight, smell, and sound

Non-declarative or procedural memory seems to be processed mainly in the premotor cortex, the basal ganglia and the cerebellum.

SUGGESTION

While sensory associations can trigger some memories, suggestions can change others. Preconceptions, prejudices, unexamined assumptions may all inûuence and color memory.

For example, psychological studies show that test participants who failed to recall a childhood event would “remember” the event in elaborated details after they were told (lied to as part of the experiment) by relatives that the false event did happen.

Another study found that 20% of test participants who failed to recall a false childhood event “remembered” it in details a week after they were encouraged to think about it.

EMOTIONAL CONTENT

We tend to remember emotionally charged events better. This is especially true for women. It is the emotion aroused that helps memory, not the importance of the experience.

We tend to remember less of what precedes an experience with strong emotional content, as well as other information encountered at the same time. That is why details of events leading up to a traumatic experience may be hard to recall.

In general, we remember pleasant experiences better. However, depressed individuals seem to remember pleasant and unpleasant events equally well.

STATE OF MIND, EMOTION AND ATTENTION

Environmental distractions can interfere with the formation and consolidation of a memory. Our emotional state also affects what is noticed, and what is remembered.

We tend to remember experiences that match our momentary state of emotion – sad memories when feeling sad. It is also easier to remember an experience in the same state of mind as when it was encoded – by evoking a sad emotion; we can remember a sad experience better.

Strong emotional content usually gets more attention. It is the amygdala that mediates emotion and attention. Studies show that the amygdala drives attention to emotion-laden – especially fear-laden- visual input.

Here are some of the more common things that can cause memory loss:

Medication: A number of prescription and over-the-counter medications can interfere with or cause loss of memory. Possible culprits include: antidepressants, antihistamines, anti-anxiety medications, muscle relaxants, tranquilizers, sleeping pills, and pain medications given after surgery.

Alcohol tobacco or drug use**:** Excessive alcohol use has long been recognized as a cause of memory loss.

Smoking: It harms memory by reducing the amount of oxygen that gets to the brain. Studies have shown that people who smoke find it more difficult to put faces with names than do nonsmokers. Illicit drugs can change chemicals in the brain that can make it hard to recall memories.

Sleep deprivation: Both quantity and quality of sleep are important to memory. Getting too little sleep or waking frequently in the night can lead to fatigue, which interferes with the ability to consolidate and retrieve information.

Depression and stress: Being depressed can make it difficult to pay attention and focus, which can affect memory. Stress and anxiety can also get in the way of concentration. When you are tense and your mind is over stimulated or distracted,

your ability to remember can suffer. Stress caused by an emotional trauma can also lead to memory loss.

Nutritional deficiency: Good nutrition including high-quality proteins and fats — is important to proper brainfunction. Deficiencies in vitamin B1 and B12 specifically can affect memory.

Head injury: A severe hit to the head — from a fall or automobile accident, for example — can injure the brain and cause both short- and long-term memory loss. Memory may gradually improve over time.

Stroke: A stroke occurs when the bloodsupply to the brain is stopped due to the blockage of a blood vessel to the brain or leakage of a vessel into the brain. Strokes often cause short-term memory loss. A person who has had a stroke may have vivid memories of childhood events but be unable to recall what he or she had for lunch.

Dementia: Dementia is the name for progressive loss of memory and other aspects of thinking that are severe enough to interfere with the ability to function in daily activities. Although there are many causes of dementia — including blood vessel disease, drug or alcohol abuse, or other causes of damage to the brain — the most common and familiar is Alzheimer's disease. Alzheimer's disease is characterized by a progressive loss of brain cells and other irregularities of the brain.

Other causes: Other possible causes of memory loss include an underactive or overactive thyroid gland and infections such as HIV, tuberculosis, and syphilis that affect the brain.

3.5 Thinking: Concept Formation, Reasoning, Problem Solving

Cognitive abilities like thinking, reasoning and problem solving may be considered to be some of the chief characteristics which distinguish human beings from other species including highly animals. Good poetry, a highly developed computer or a robot, a beautiful painting, or magnificent buildings are all products of the thinking, reasoning and problem-solving capabilities of their creators and inventors. The challenges and problems faced by the individual or by the society, in general are solved through serious efforts involving thinking and reasoning. The powers of thinking and reasoning may thus be considered to be the essential tools for the welfare and meaningful existence of the individual as well as society.

Thinking is an incredibly complex process and the most difficult concept in psychology to define or explain. Some of the definitions are as follows:

Ross (1951) “thinking is mental activity in its cognitive aspect or mental activity with regard to psychological objects”.

Garrett (1968) “thinking is behavior which is often implicit and hidden and in which symbols (images, ideas, concepts) are ordinarily employed”.

Mohsin (1967) “thinking is an implicit problem-solving behaviour”.

The process of thinking and the product of thinking are both actually assessed by what obtained as a result of thinking. The lines along which individuals think must, therefore, always be inferred from the way they behave. Internal representation or mental explanation of the thing or events i.e., internal behaviour, should be made an essential aspect of the thinking process used in the problem-solving behaviour. Thinking may thus be defined as a pattern of behaviour in which we make use of internal representations (symbols, signs, etc) of things and events for the solution of some specific, purposeful problem.

TYPES OF THINKING

1. **Perceptual or Concrete Thinking:**

This is the simplest form of thinking the basis of this type is perception, i.e. interpretation of sensation according to one’s experience. It is also called concrete thinking as it is carried out on the perception of actual or concrete objects and events.

2**. Conceptual or Abstract Thinking:**

Here one makes use of concepts, the generalized objects and languages, it is regarded as being superior to perceptual thinking as it economizes efforts in understanding and problem-solving.

3. **Reflective Thinking:**

This type of thinking aims in solving complex problems, thus it requires reorganization of all the relevant experiences to a situation or removing obstacles instead of relating with that experiences or ideas.

This is an insightful cognitive approach in reflective thinking as the mental activity here does not involve the mechanical trial and error type of efforts.

In this type, thinking processes take all the relevant facts arranged in a logical order into an account in order to arrive at a solution of the problem.

4. **Critical Thinking:**

It is a type of thinking that helps a person in stepping aside from his own personal beliefs, prejudices and opinions to sort out the faiths and discover the truth, even at the expense of his basic belief system.

Here one resorts to set higher cognitive abilities and skills for the proper interpretation, analysis, evaluation and inference, as well as explanation of the gathered or communicated information resulting in a purposeful unbiased and self-regulatory judgement.

5. Creative Thinking:

This type of thinking is associated with one's ability to create or construct something new, novel or unusual. It looks for new relationships and associations to describe and interpret the nature of things, events and situations. Here the individual himself usually formulates the evidences and tools for its solution. For example; scientists, artists or inventors.

Skinner, the famous psychologist says creative thinking means that the prediction and inferences for the individual are new, original, ingenious and unusual. The creative thinker is one who expresses new ideas and makes new observations, new predictions and new inferences.

6. Non-directed or Associative Thinking:

There are times when we find ourselves engaged in a unique type of thinking which is non-directed and without goal. It is reflected through dreaming and other free-flowing uncontrolled activities. Psychologically these forms of thought are termed as associative thinking.

Here day-dreaming, fantasy and delusions all fall in the category of withdrawal behaviour that helps an individual to escape from the demands of the real world by making his thinking face non-directed and floating, placing him somewhere, ordering something unconnected with his environment.

TOOLS OF THINKING

The various tools involved in the thinking may be summarized as follows.

IMAGES: Images, as mental pictures consist of personal experiences of objects, persons or scenes actual objects, experiences and activities, in thinking; we usually manipulate the images rather than the actual objects, experiences or activities.

CONCEPTS: a concept is a general idea that stands for a general class and represents the common characteristic of all objects or events of this general class. Concept, as a tool, economise the efforts in thinking.

SYMBOLS AND SIGNS: Symbols and signs represent and stand for substitute for the actual objects, experiences and activities. In this sense, they are not confined to words, mathematical numerals and terms. Traffic light, railway signals, school bells, badges, songs, flags and slogans are all forms of symbolic expression. These symbols and signs stimulate and economise thinking.

LANGUAGE: Language is the most efficient and developed vehicle used for carrying out the process of thinking. When one reads, writes or hears words, phrases or sentences or observes gesture in any language, one is stimulated to think. Reading and writing of documents and literature also help in stimulating and promoting the thinking process.

MUSCLE ACTIVITIES: thinking in one way or other shows evidence of the involvement of some incipient movements of groups of our muscles. It can be easily noticed that there are slight muscular responses when we think of a word, resembling the movements used when we say the word aloud.

BRAIN FUNCTION: Whatever may be the role of the muscles, thinking is primarily a function of the brain. Our mind or brain is said to be the chief instrument or seat for the carrying out of the process of thinking. The mental pictures or images can be stored, formed, reconstructed or put to use only on being processed by the brain.

CONCEPT FORMATION

The process by which we discover the feature or features which are 'common' to a large number of objects and associate these with a symbol which thereafter may be applied to other similar objects is called 'Concept formation'.

STEPS IN CONCEPT FORMATION

Observation:

The first stage in the formation of concepts is the observation of an event, object or an experience. This can also be called the stage of becoming aware. This can be either direct or indirect. The child can directly see a dog and become aware of it.

On the other hand, he also hears stories about devils and giants from his parents and grandparents; here the awareness is indirect. Thus, all of us have some knowledge or awareness of primitive people (or at least we believe we have) even though most of us have not seen them. Generally repeated experiences provide the basis for the development of concepts.

Generalization:

Repeated experiences or observations of different objects result in a tendency to form a general idea. Thus, a child first sees one dog, then another dog, then a third and so on and begins to form the general idea of a dog. This is called the process of generalization. The process of generalization explains how the child acquires many concepts like the concepts of gender, shape, number, etc.

Discrimination or Differentiation:

Along with generalization and the observation and organization of similarities among things and objects, the child also becomes aware of the differences between them. Thus, all dogs are alike and all cows are alike. Dogs run on four legs and cows also do the same.

At the same time dogs and cows are different from each other and big dogs are different from small dogs, and bulls are different from cows. It is this type of sequential operation of generalization and differentiation in interaction that leads to the formation of concepts.

Abstraction

From the description of the above processes the operation of abstraction becomes evident. The child has seen dogs and he happens to see a cow on a different occasion. He does not observe them at the same time but inwardly he compares his experiences on the two occasions.

The perceptions and the experiences are now inwardly analysed and re-experienced in the absence of the objects. This results in an appreciation of similarities and differences. This process by which the experience is analysed in the absence of actual situations is known as abstraction. It is abstraction which actually transforms comparable and contrasting experiences into concepts.

This ability to respond to concrete situations in the absence of the actual situations is known as abstract thinking ability. It can be seen that as the child grows older, the process of abstraction plays an increasingly important role in the development of concepts. It is this process of abstraction which helps us to form ideas of the future and far off objects.

The growth of science, in particular, and knowledge, in general and, perhaps, the growth of culture and civilization, have all been possible because of our ability to form abstract concepts. Concepts like force, energy, mind, truth are all examples of

abstract concepts. Literary creations, masterpieces in art and other fields are all embodiments of abstract concepts.

PROBLEM SOLVING

From birth onwards, everybody in this world is beset with some problem or the other. There are needs and motives that are to be satisfied. For this purpose, definite goals or aims are set. In an attempt for their realization one experiences obstacles and interferences in one's attempt to achieved them. This creates problems and serious and deliberate efforts have to be made to overcome these impediments. The productive work involved in the evaluation of the situation and the strategy worked out to reach one's set goals is collectively termed problem solving. This is an essential exercise for individual advancement as also for the advancement of society. The meaning and nature of problem solving is further clarified by the following definitions:

Woodworth and Marquis(1948) defined "Problem-solving behaviour occurs in novel or difficult situations in which a solution is not obtainable by the habitual methods of applying concepts and principles derived from past experience in very similar situations.

STEPS IN PROBLEM SOLVING

The following steps include developing strategies and organizing knowledge.

1. **Identifying the Problem:** While it may seem like an obvious step, identifying the problem is not always as simple as it sounds. In some cases, people might mistakenly identify the wrong source of a problem, which will make attempts to solve it inefficient or even useless.
2. **Defining the Problem:** After the problem has been identified, it is important to fully define the problem so that it can be solved.
3. **Forming a Strategy:** The next step is to develop a strategy to solve the problem. The approach used will vary depending upon the situation and the individual's unique preferences.
4. **Organizing Information:** Before coming up with a solution, we need to first organize the available information. What do we know about the problem? What do we *not* know? The more information that is available, the better prepared we will be to come up with an accurate solution.
5. **Allocating Resources:** Of course, we don't always have unlimited money, time, and other resources to solve a problem. Before you begin to solve a problem, you need to determine how high priority it is. If it is an important

problem, it is probably worth allocating more resources to solving it. If, however, it is a fairly unimportant problem, then you do not want to spend too much of your available resources into coming up with a solution.

6. **Monitoring Progress:** Effective problem-solvers tend to monitor their progress as they work towards a solution. If they are not making good progress toward reaching their goal, they will reevaluate their approach or look for new strategies.
7. **Evaluating the Results:** After a solution has been reached, it is important to evaluate the results to determine if it is the best possible solution to the problem. This evaluation might be immediate, such as checking the results of a math problem to ensure the answer is correct, or it can be delayed, such as evaluating the success of a therapy program after several months of treatment.

FACTORS AFFECTING PROBLEM SOLVING

Everyone one of us in life faces one or other problem. We make our attempts with all the resources in hand in finding out solutions to these problems. In doing so, many times we get success but it may also go otherwise. There are factors which are attributed as causes for our success or failure in problem-solving behaviour. There are a number of such factors which may be broadly classified in the following categories.

1. **The level of previous learning or training**: one can solve a problem easily if it has some connection with one's past experiences or specific training received for the solution of similar problems. Hence the level of proficiency gained through some learning or training of one or the other types of problem, always works as a deciding factor for the problem-solving behaviour of an individual.
2. **Interest and motivational level of the problem solver**: Interest and motivation are known as the key factors and moving forces behind any activity or behaviour carried out by an individual. It equally applies to one's problem-solving behaviour. The nature of interest and motivation thus should always be regarded as important factors affecting a person's problem solving behaviour.
3. **Understanding and analysis of the problem**: Every problem needs a proper understanding and careful analysis before attempting to find a solution. However, the problem solver often tends to act in haste and rush to find solutions without understanding what the problem actually is.

4. **Mental set**: Our problem-solving behaviour depends much on a particular type of mental set, woven around the ways and means of finding solutions to one or the other types of problems. It is our previous learning and experiences that go deep into our nature, giving birth a certain fixed type-solving behaviour. As a result we always try to solve a given problem in the light of a mental picture of its solution already set in our mind. Mental set may be regarded as a way of perceiving things in the light of their mental images already fixed in our mind based on past experiences.

5. **Functional fixedness**: It refers to our rigidity or fixedness in our functions or ways of behaving. As a result, we always tend to provide similar responses to the same stimuli. We have a fixed pattern of problem solving behaviour to find solution for a particular type of problem. We cannot think of any alternative or a new solution other than habitually adopted by us for their solution.

6. **Mental and Physical states of the problem sol**ver: the mental and physical states of an individual at the time of solving a problem definitely exercise their favorable or unfavorable impact over the processes and products of his problem-solving behaviour. If he is alert, attentive, capable and active in using his physical and mental abilities to find a solution to the problem, he is sure to proceed properly on the path of problem solving. Otherwise, there will be a lot of difficulties in getting success in the task of problem solving. Take the case of anxiety, i.e. state of anxiousness. It helps the individual in his problem-solving task as an energizer of his otherwise motivated behaviour if it remains within his control. But if it exceeds and reaches out of control, it may prove a great obstacle in the path of problem-solving.

7. **The time spent on solving the problem**: every problem needs its own time for its solution. Hence the minimum desired time should be spent in its solution depending upon its nature and complexity, from the viewpoint of the solver. However, in case one is in haste or does not care to give the required time to find solution to his problem, he may not get the desired success.

PROBLEM-SOLVING STRATEGIES

- **Algorithms:** An algorithm is a step-by-step procedure that will always produce a correct solution. A mathematical formula is a good example of a problem-solving algorithm. While an algorithm guarantees an accurate answer, it is

not always the best approach to problem-solving. This strategy is not practical for many situations because it can be so time-consuming. For example, if you were trying to figure out all of the possible number combinations to a lock using an algorithm; it would take a very long time!

- **Heuristics:** A heuristic is a mental rule-of-thumb strategy that may or may not work in certain situations. Unlike algorithms, heuristics do not always guarantee a correct solution. However, using this problem-solving strategy does allow people to simplify complex problems and reduce the total number of possible solutions to a more manageable set.
- **Trial and Error:** A trial-and-error approach to problem-solving involves trying a number of different solutions and ruling out those that do not work. This approach can be a good option if you have a very limited number of options available. If there are many different choices, you are better off narrowing down the possible options using another problem-solving technique before attempting trial-and-error.
- **Insight:** In some cases, the solution to a problem can appear as a sudden insight. According to researchers, insight can occur because you realize that the problem is actually similar to something that you have dealt with in the past, but in most cases, the underlying mental processes that lead to insight happen outside of awareness.

REASONING

Reasoning plays a significant role in one's adjustment to one's environment. It controls not only one's cognitive activities but also influence the total behaviour and personality by the proper or improper development of one's reasoning ability. It is essentially a cognitive ability and is like thinking in many aspects.

Garrett (1968) "Reasoning is a stepwise thinking with a purpose or goal in mind".

Gates (1947) "Reasoning is the term applied to highly purposeful, controlled and selective thinking".

Skinner (1968) "Reasoning is the word used to describe the mental recognition of cause and effect relationships, it may be the prediction of an event from an observed cause or the inference of a cause from an observed event".

TYPES OF REASONING

1. Inductive reasoning:

It is a specialized thinking aimed at the discovery or construction of a generalized principle by making use of particular cases, special examples and identifying of elements or relations.

For example, Mohan is mortal, Radha is mortal, Karim is mortal; therefore, all human beings are mortal.

2. Deductive reasoning:

It is the ability to draw some logical conclusions from known statement or evidences. Here one starts with already known or established generalized statement or principle and applies it to specific cases. For example, all human beings are mortal you are a human being, therefore, you are mortal.

Henry has categorized three types of deductive reasoning:

i. Conditioned reasoning:

It is the reasoning tied down by some specific condition such as the following. For example, if there is a solar eclipse, the street will be dork. There is a solar eclipse

∴ The streets are dark.

ii. Categorical reasoning:

This type of reasoning is based on some categorical statements. For example, all Robins are birds. All birds lay eggs.

∴ All Robins lay eggs.

iii. Linear reasoning:

This type of reasoning involves straight forward relationships among elements.For example, If Ram is taller than Mohan and Mohan is taller than Sohan, Ram is the tallest.

3.6 Intelligence: Nature, Types, Theories and Assessment

In our day-to-day life conversation we often comment that a particular child or individual is very intelligent or is not intelligent. All such comments are based on our observation

of the performance or behaviour of the individual concerned in comparison to others of his groups.

At various points throughout recent history, researchers have proposed some different definitions of intelligence. While these definitions can vary considerably from one theorist to the next, current conceptualizations tend to suggest that intelligence involves the level of ability to do the following:

- **Learn:** The acquisition, retention, and use of knowledge is an important component of intelligence.
- **Recognize problems:** To put knowledge to use, people must be able to identify possible problems in the environment that need to be addressed.
- **Solve problems:** People must then be able to take what they have learned to come up with a useful solution to a problem they have noticed in the world around them.[1]ÿþ

Intelligence involves some different mental abilities including logic, reasoning, problem-solving, and planning. David Wechsler (1944) defined intelligence as "Intelligence is the aggregate or global capacity of an individual to act purposefully, to think rationally, and to deal effectively with his environment".

NATURE OF INTELLEGENCE

The true nature of intelligence can be understood by first defining it to understand its meaning, discussing the various theories explaining its structure in terms of the several constituents and factors and identifying the numerous other aspects and characteristics related to intelligence and it's functioning.

Distribution of intelligence: The distribution of intelligence is not equal among all human beings. It resembles the pattern of distribution of health, wealth, beauty and similar other attributes or endowments.

Individual differences in intelligence: Wide individual differences exist among individuals with regard to intelligence. Truly speaking, no two individuals, even identical twins or individuals nurtured in identical environments are endowed with equal mental energy. The assessment of intelligence by various tests has given enough reasons to believe that not only does intelligence vary from individual to individual but it also tends to vary in the same individual from age to age and situation to situation.

Intelligence and changes in age: As the child grows in age, so does the intelligence as shown by the intelligence tests. The question which now arises is, at what age does this increase stop? The age at which mental growth ceases varies from individual to individual. It tends to civilize after age of 10 and is fully stabilized during adolescence. The idea that intelligence continues to grow throughout life is not strictly true.

Intelligence and the sexes: Many studies have been conducted to find out whether men are more intelligent than women and vice versa but no significant difference has been found. It may therefore, be stated that difference in sex does not contribute towards difference in intelligence.

Intelligence and racial or cultural differences: The hypothesis whether a particular race or caste or cultural group is superior to another in intelligence has been examined by many research workers. The results of earlier studies which take whites to be superior race in comparison to the blacks have been questioned. It has now been established that intelligence is not the birthright of a particular race or group. The "bright" and the "dull" can be found in any race or caste and the difference which are found can be the result of environmental factors or influences.

TYPES OF INTELLIGENCE:

1. The Abstract:

Abstract intelligence is exhibited in our dealings with symbols — words, numbers, formulas and diagrams. This ability is conspicuously absent in animals. The abstractly intelligent person is able to discover relations among symbols and to solve problems with their aid. Lawyers, physicians, literary men—professional people generally-as well as businessmen, statesmen, and the like should possess abstract intelligence on high degree./

2. The Mechanical or Concrete:

Mechanical intelligence enables its possessor to deal readily with machines and mechanical contrivances. The engineer, the master mechanic, the highly trained industrial worker must all be mechanically intelligent

THEORIES OF INTELLIGENCE

1. The Monarchic Theory:

According to this theory, intelligence is regarded as an adaptiveness which enables a creature to adjust itself to changing environment. People holding this view believe in inborn all-round mental efficiency as a sign of intelligence.

According to this view, a person who can perform one intellectual task very well, can also perform another task equally well. Dr. Johnson, who believed in such a doctrine, said that if Newton could have turned his mind to poetry, he would have been as great a poet as he was a mathematician.

2. Anarchic Theory:

The chief exponent of this theory is Prof. Thorndike. According to him, the mind is a host of highly particularized and independent faculties. The theory maintains that from a man's ability to do one kind of work we can infer absolutely nothing as to his ability to do another kind of works.

If a boy is good in literature, we can judge absolutely nothing about his ability to study Chemistry; even in scientific subjects, if they are unrelated to each other, from one's ability to do well in one subject, one can say nothing whether in another subject he would do equally well or not.

3. Spearman Two Factor Theory:

This theory was advocated by Spearman (1923). According to him, each intellectual activity involves a general factor 'g' which it shares with all intellectual activities and specific factor 's' which belongs to it alone.

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. The amount of 'g' in a person depends on the amount of cortical energy present and the maximum quantum of this is fixed. How much of this energy one utilizes depends on the motivation, available in environment and previous experiences etc. In addition to this 'g' factor there are specific abilities, which give an individual the ability to deal with specific problems. Fro example, an individual's performance in hindi is partly due to his general intelligence and partly due to his specific aptitude for the language which he might possesses.

5. Thurstone's Primary Mental Ability Theory:

No one questions the fact that persons superior on one 'intelligence' test are generally superior on others. Whether we should interpret this as evidence for a basic general intelligence, or 'g' is more debatable. Dr. L.L. Thurstone has argued that 'g' can be broken up into a cluster of related abilities, which he calls the primary mental abilities. Because the methods of factor analysis are basic to his proof that such abilities exist, he refers to his theory as a multifactor theory of mental organization.

In the Thurstone study, a wide variety of tests, calling for almost every kind of performance we could describe as intelligence, was administered to a large population of high school and college students. As Spearman had predicted, all the correlations were positive.

It was however, possible to show that some tests grouped themselves together in clusters, seeming by having something in common. The correlations within the cluster were higher than wits tests not in the cluster. Thurstone suggested that each group of test was lapping some primary mental ability.

According to Thurstone the primary mental abilities are:

1. Number Ability (N): it is concerned with the ability to do numerical calculations, rapidly and accurately.
2. Verbal Comprehension (V): it is concerned with comprehension of verbal relations, words and ideas.
3. Spatial Relations (S): it is involved in any task in which the subject manipulates an object imaginatively in space.
4. Word Fluency (W): it is involved whenever the subject is asked to think of isolated words at a rapid rate.
5. Reasoning (R): in inductive reasoning is the ability to draw inferences on the basis of specific instances. While in deductive reasoning it is the ability to make use of generalized results
6. Memory (M): it involves the ability to memorize quickly.
7. Perceptual Ability (P): it is ability to perceive objects accurately.

GUILFORD'S STRUCTURE MODEL OF INTELLECT

Guilford (1961) with his associates developed a model of intelligence on the basis of the factor analytical research studies conducted by them which involved a number of intelligence tests. They concluded that every mental process or intellectual activity can be described in terms of three basic dimensions or parameters known as operation-the act of thinking, content-the terms in which we think and the product- the ideas we come up with. Each of these parameters are further subdivided into specific factors or elements.

This three dimensional theory was propounded by Guilford and his associates in the Psychological laboratory at the University of Southern California in 1966. Through

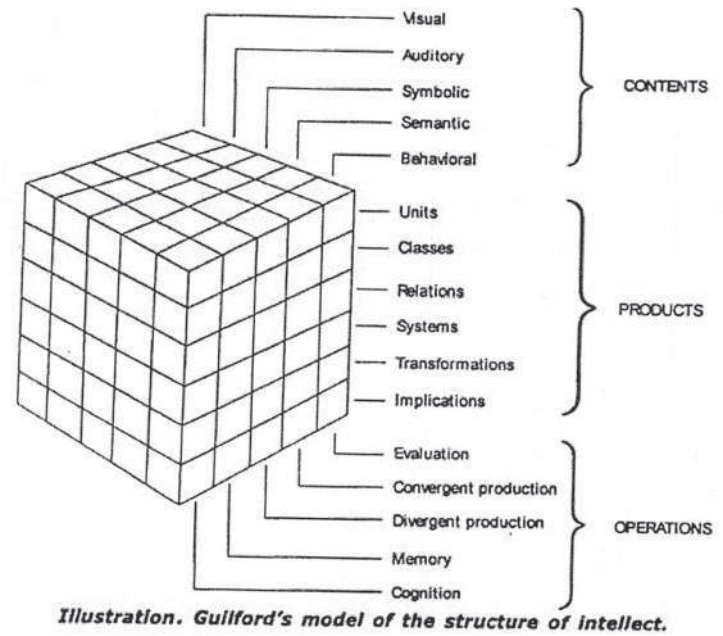


Illustration. Guilford's model of the structure of intellect.

his later researches Guilford (1967) expanded his cube-shaped model of intellect to include 150 factors (by dividing the figural factor of the contents into two separate categories— visual and auditory).

(1) Operations:

Operations are products which involve the following five major groups of intellectual abilities and behaviour:

i. Cognition:

Cognition is the major fundamental operation in learning.

ii. Memory:

Retention of what is recognized is memory. It is basic primary mental ability.

iii. Convergent thinking:

It is the generation of information from given information, where the emphasis is upon achieving conventionally accepted best outcomes.

iv. Divergent thinking:

In divergent thinking we think is different directions searching and seeking some variety and novelty. It is closely associated with creativity.

v. Evaluation:

In evaluation we reach conclusions and decisions as to goodness, correctness, suitability or adequacy of what we know what we remember and what we produce in productive thinking.

(2) Content:

The factors of the operations involve following four kinds of material content:

(i) Figural Content:

Things we feel or hear provide other figural material. It is concrete material such as perceived through the senses.

(ii) Symbolic Content:

It is composed of letters digits and other conventional signs.

(iii) Semantic Content:

Semantic content is in the form of verbal meanings or ideas for which no examples are necessary.

(iv) Behaviour Content:

It is related with the social behaviour in society

(3) Products:

When a certain operation is applied to certain kind of content the following six types of products are involved:

(i) Units,

(ii) Classes,

(iii) Relations,

(iv) Systems,

(v) Transformations, and

(vi) Implications.

Table Division of Intellectual Activity into parameters and specific factors

Operations	*Contents*	*Products*
Evaluation (E) Convergent thinking (C) Divergent thinking (D) Memory (M) Cognition (C)	Figural Factor (F) (*i.e.* concrete material perceived through senses) Symbolic (S) (*i.e.* material in the form of signs and symbols) Semantic (M) (*i.e.* material in the form of verbal meaning of ideas) Behavioural (B)	Units (U) Classes (C) Relations (R) Systems (S) Transformation (T) Implication (I)

Triarchic Theory of Intelligence

The triarchic theory of intelligence was formulated by Robert Sternberg in the 1980s. The theory attempts to understand the human intelligence in terms of distinct components rather than a single ability. The tri-archic theory by Sternberg categorized intelligence into three different aspects.

- Componential – Analytic skills
- Experiential – Creativity
- Practical – Contextual skills

Before Sternberg, general intelligence was the idea that dominated most of the intelligence theories. However, Sternberg believed intelligence to be a much more complex subject matter, which leads him to propose a theory dealing with the cognitive approach to intelligence theory rather than a behavioristic view point. He believed that a person's adaptation to the changing environment and his contribution of knowledge in shaping the world around them had a significant importance in determining their intelligence.

Sternberg also argued that intelligent tests were wrong to ignore creativity, and there are always other important characteristics like cognitive processes, performance components, planning and decision making skills, and so on.

Considering the way human beings process information in executing a mental a task, Sternberg laid down a triarchic structure for his theory of intelligence based on three sub-theories. They are as follows.

Componential – Analytical Intelligence

Analytical Intelligence can also be referred to as being **book smart**. This form of intelligence is more in terms with the traditional definitions of IQ and academic achievement. It's also called componential intelligence. Because of its analytical nature, the person with high analytical intelligence is good at problem solving. These people are generally more able to see the solutions not normally seen, because of their abstract thinking and evaluation skills. Analyzing someone's analytical intelligence can be done by few general questions like

Experiential – Creative Intelligence

The ability to invent new ideas and solutions when dealing with new situations is regarded as creative intelligence. It's also referred as experiential intelligence. This form of intelligence is associated with using existing knowledge and skills in order to deal with new problems or situations.

Practical – Contextual Intelligence

In simple words, practical intelligence can be defined as **street-smart.** The ability of a person to adapt in an environment or change it accordingly to best suit the personal needs is dubbed as practical intelligence. Another way to understand such type of intelligence is as common sense. Dealing with the everyday tasks in the best possible manner shows the person's intelligence.

This declaration made out intelligence-to be a factor of a practical nature rather than a mere abstraction. Sternberg sought the real function and purpose of human intelligence by considering it as a proper instrument for adaptation and the selection and shaping of one's environment.

GARDNER'S THEORY OF MULTIPLE INTELLIGENCE

Howard Gardner has propounded a unique theory of intelligence called the "theory of multiple intelligence". Through his new theory, Gardner challenged the notion of general intelligence, "g" and then questioned the very basis of prevailing intelligence tests by asking how an individual's intellectual capacities could be captured in a single measure of intelligence. He asserted that human intelligence or cognitive competence can be better described as a set of an individual's multiple abilities, talents and mental skills related to a multiple number of domains of knowledge in a particular cultural setting. He concluded that there are seven independent types of intelligence that grow and develop differently in different people, depending upon their hereditary characteristics or environmental experiences. By calling them

independent, Gardener meant that each intelligence is a relatively autonomous intellectual potential which is capable of functioning independently of the others.

Linguistic intelligence: this type of intelligence is responsible for all kinds of linguistic competence-abilities, talents and skills, available in human beings. It can be broken down into components like: syntax, semantics and pragmatics as well as written or oral expression and understanding. This type of intelligence is visible in professionals like; lawyers, lecturers, writers etc.

Logical- mathematical intelligence: This type of intelligence is responsible for all types of abilities, talents and skills in areas related to logic and mathematics. It includes components like deductive reasoning, inductive reasoning, and scientific thinking including solving of logical puzzles, carrying out calculations. Professionals like mathematicians, philosophers, physicist etc. are found to exhibit this type of intelligence.

Spatial intelligence: This type of intelligence is concerned with the abilities, talents and skills involving the representation and manipulation of spatial configuration and relationship. This includes people like painters, land surveyors, architects, engineers, sculptures.

Musical intelligence: This type of intelligence covers the abilities, talents and skills pertaining to the field of music. It may exhibit through one's capacity for pitch discrimination, sensitivity to rhythm, texture and timbre, ability to hear themes in music. It is visible in a quite large proportion in professionals like musicians and composers.

Bodily Kinesthetic intelligence: This type of intelligence is concerned with the set of abilities, talents and skills involved in using one's body or its various parts to perfume skillful and purposeful movements. Among professionals, dancers, athletes, and surgeons may be seen to demonstrate a high degree of body-kinesthetic intelligence in their respective fields.

Intra-personal intelligence: it consists of individual's abilities to enable him to know his self. It includes knowledge and understanding of one's own cognitive strengths, styles and mental functioning. It helps an individual to understand his own self by providing an insight into his total behaviour-what he feels, thinks or does.

Interpersonal intelligence: it consists of the abilities to understand individuals other than one's self and one's relations to others. In includes the ability to act productively, based on the understanding of others. The knowledge and understanding of others is the quality that is needed for social interaction in one's day-to- day life.

In this way Gardner's theory of multiple intelligence provides a broad and comprehensive view of human abilities, extending from linguistic and logical mathematical abilities on the one hand, to intrapersonal and interpersonal abilities in the other.

CATTELL AND HORN'S THEORY OF INTELLIGENCE

Psychologist Raymond Cattell first proposed the concepts of fluid and crystallized intelligence and further developed the theory with his student John Horn. The Cattell-Horn theory of fluid and crystallized intelligence suggests that intelligence is composed of different abilities that interact and work together to produce overall individual intelligence.

Fluid intelligence or fluid reasoning is the capacity to think logically and solve problems in novel situations, independent of acquired knowledge. It is the ability to analyze novel problems, identify patterns and relationships that underpin these problems and the extrapolation of these using logic. It is necessary for all logical problem solving, especially scientific, mathematical and technical problem solving. Fluid reasoning includes inductive reasoning and deductive reasoning.

Examples of the use of fluid intelligence include solving puzzles and coming up with problem-solving strategies. This aspect of intelligence involves the ability to solve problems and reason about things independent of previously existing knowledge.When you encounter an entirely new problem that cannot be solved with your existing knowledge, you must rely on fluid intelligence to solve it. Fluid intelligence tends to decline during late adulthood. Certain cognitive skills associated with fluid intelligence tend to decline as people reach later adulthood.

Crystallized intelligence is the ability to use skills, knowledge, and experience. It should not be equated with memory or knowledge, but it does rely on accessing information from long-term memory. Rather, it is specially learned and is, therefore dependent on education and culture. It involves one's acquired fund of general information consisting of knowledge and skills essential for performing different tasks in one's day-to-day life.

Thus, while fluid intelligence is characterized by a relatively high degree of culture, education, experience and training free performances in abstraction, thinking, reasoning and imagination, crystallized intelligence is known for its evolution through experience, training and interaction with one's environment over a number of years.

ASSESSMENT OF INTELLIGENCE

In 1905, Alfred Binet and Theodore Simon, made the first successful attempt to formally measure intelligence. In 1908, when the scale was revised, they gave the concept of

Mental Age (MA), which is a measure of a person's intellectual development relative to people of her/his age group. A mental age of 5 means that a child's performance on an intelligence test equals the average performance level of a group of 5-year olds. Chronological Age (CA) is the biological age from birth. A bright child's MA is more than her/his CA; for a dull child, MA is below the CA. Retardation was defined by Binet and Simon as being two mental age years below the chronological age. In 1912, William Stern, a German psychologist, devised the concept of Intelligence Quotient (IQ). IQ refers to mental age divided by chronological age, and multiplied by 100. IQ = ´ 100 the number 100 is used as a multiplier to avoid the decimal point. When the MA equals the CA, the IQ equals 100. If MA is more than the CA, IQ is more than 100. IQ becomes less than 100 when the MA is less than the CA. For example, a 10-year-old child with a mental age of 12 would have an IQ of 120 (12/10 ´ 100), whereas the same child with an MA of 7 would have an IQ of 70 (7/10 ´ 100). The average IQ in the population is 100, irrespective of age. IQ scores are distributed in the population in such a way that the scores of most people tend to fall in the middle range of the distribution. Only a few people have either very high or very low scores. The frequency distribution for the IQ scores tends to approximate a bell shaped curve, called the normal curve. This type of distribution is symmetrical around the central value, called the mean. All persons do not have the same intellectual capacity; some are exceptionally bright and some are below average. One practical use of intelligence test is to identify persons at the extremes of intellectual functioning.

CLASSIFICATION OF INTELLIGENCE TEST

Intelligence tests may be broadly classified as follows:

1. Individual tests in which only one individual is tested at a time.

2. Group tests in which a group of individuals are tested at the same time. Further, intelligence tests may also be classified on the basis of their forms as verbal or language tests and non-verbal or non-language tests.

Verbal or Language Tests:

In these the subjects make use of language in which the instructions are given in words, written, oral or both the individuals being tested are required to use language, verbal or written, for their responses.

a. Vocabulary tests: In these the subject is required to give the meanings of words or phrases.

b. **Memory tests:** These are designed to test the subjects' immediate and long-term memory and include all recall and recognition type of items like telephone number, vehicle number, teachers, names, etc

c. Comprehension tests: By means of these, the subject is tested for the ability to grasp, understand and react to a given situation

d. **Information tests:** The subject is tested on his knowledge about the things around him by means of these tests.

e. **Reasoning tests:** In these tests the subject is asked to provide answers which demonstrate his ability to reason logically, analytically, systematically, inductively or deductively as, for example 1, 2, 4, 7, 11, 16, 22, 29, ….

f. **Association tests:**Through these test items the subject is tested for his ability to point out the similarities or dissimilarities between two or more concepts or objects.

Non-Verbal and Non-Language Tests:

These tests involve activities in which the use of language is not necessary. Performance tests are the typical examples for these type of tests. Here the individual is tested through material objects, where he is instructed orally and the reactions of the person is assessed with respect to the individual's approach towards the work. Then needed directions are provided to him.

Individual Verbal Intelligence Tests:

Tests involving the use of language are administered to one individual at a time, e.g. the Stanford Binet scale, individual performance tests, Arthur point scale, Bhatia's battery of performance test.

Group Verbal Intelligence Tests:

The tests which necessitate the use of language and are applied to a group of individuals at a time. For example,

1. Army alpha test (developed during World War I)
2. Army general classification Test (World War II).

Popular Indian tests of this nature are:

a. Group tests of intelligence prepared by Bureau of Psychology, Allahabad (Hindi).

b. SamuhikBudhiPariksha (Hindi) prepared by PL Shrimali, VidyaBhavan GS Teacher College, Udaipur.

Group Non-Verbal Intelligence Tests:

These tests do not necessitate the use of language and are applicable to a group of individuals at a time. The difference between performance tests (used for an individual) and non-verbal tests (used for a group) is one of the degree as far as their non-verbal nature is concerned.

The individual performance tests require the manipulation by the subject of concrete objects or materials supplied in the test. The responses are purely motor in character and seldom requires the use of paper and pencil by the testee.

Uses of Intelligence Tests:

a. Use in selection:

Results of intelligence tests can be used for selection of suitable candidates for training in educational and professional skills such as admission to special courses, selection of the trainees, etc.

b. Use in classification:

Intelligence tests help in classifying individuals according to their mental makeup, e.g. in schools, teachers responsibility is to classify the students in his class as backward, average, bright or gifted, and thus arrange for homogenous grouping to provide proper educational opportunities.

c. Use in assessment for promotion:

The results of intelligence tests along with the achievement tests can be successfully used for promotion of students to the next higher grades of classes.

d. Use in provision of guidance:

The results of intelligence tests may be successfully used in providing training to teachers and for personnel guidance.

e. Use for improving the learning process:

Results of the intelligence testing may prove helpful to teachers to plan the teaching-learning skills.

f. Use for diagnosis:

The other use relates with its capacity to diagnose, distinguish and discriminate the differences in the mental functioning of individuals.

g. Use in research work:

The intelligence tests can be used in carrying out research in the field of education, psychology and sociology with different age groups for generalization.

CULTURE AND INTELLIGENCE

A major characteristic of intelligence is that it helps individuals to adapt to their environment. The cultural environment provides a context for intelligence to develop. Vygotsky, a Russian psychologist, has argued that culture provides a social context in which people live, grow, and understand the world around them. For example, in less technologically developed societies, social and emotional skills in relating to people are valued, while in technologically advanced societies, personal achievement founded on abilities of reasoning and judgment is considered to represent intelligence.From your previous reading you know that culture is a collective systemof customs, beliefs, attitudes, and achievements in art and literature. A person's intelligence is likely to be tuned by these cultural parameters. Many theorists have regarded intelligence as attributes specific to the person without regard to their cultural background. The unique features of culture now find some representation in theories of intelligence. Sternberg's notion of contextual or practical intelligence implies that intelligence is a product of culture. Vygotsky also believed that cultures, like individuals, have a life of their own; they grow and change, and in the process specify what will be the end-product of successful intellectual development. According to him, while elementary mental functions (e.g., crying, attending to mother's voice, sensitivity to smells, walking, and running) are universal, the manner in which higher mental functions such as problem solving and thinking operate are largely culture-produced. Technologically advanced societies adopt child rearing practices that foster skills of generalization and abstraction, speed, minimal moves, and mental manipulation among children. These societies promote a type of behaviour, which can be called technological intelligence. In these societies, persons are well-versed in skills of attention, observation, analysis, performance, speed, and achievement orientation. Intelligence tests developed in western cultures look precisely for these skills in an individual. Technological intelligence is not so valued in many Asian and African societies. The qualities and skills regarded as intelligent actions in non-western cultures are sharply different, though the boundaries are gradually vanishing under the influence of western cultures. In addition to cognitive competence that is very specific to the individual, the nonwestern cultures look for skills to relate toothers in the society. Some non-western societies value self-reflection and collectivistic orientation as opposed to personal achievement and individualistic orientation.

INTELLIGENCE IN THE INDIAN TRADITION

Contrary to technological intelligence, intelligence in the Indian tradition can be termed as integral intelligence, which gives emphasis on connectivity with the social and world environment. Indian thinkers view intelligence from a holistic perspective where equal attention is paid to cognitive and non-cognitive processes as well as their integration. The Sanskrit word 'buddhi' which is often used to represent intelligence is far more pervasive in scope than the western concept of intelligence. Buddhi, according to J.P. Das, includes such skills as mental effort, determined action, feelings, and opinions along with cognitive competence such as knowledge, discrimination, and understanding. Among other things, buddhi is the knowledge of one's own self based on conscience, will and desire. Thus, the notion of buddhi has affective and motivational components besides a strong cognitive component. Unlike the western views, which primarily focus on cognitive parameters, the following competencies are identified as facets of intelligence in the Indian tradition:

- Cognitive capacity (sensitivity to context, understanding, discrimination, problem solving, and effective communication).
- Social competence (respect for social order, commitment to elders, the young and the needy, concern about others, recognizing others' perspectives).
- Emotional competence (self regulation and self-monitoring of emotions, honesty, politeness, good conduct, and self-evaluation).
- Entrepreneurial competence (commitment, persistence, patience, hard work, vigilance, and goal-directed behaviours).

3.6.1 CREATIVITY

In the foregoing sections, you have read that there are variations in psychological attributes like intelligence, memory, thinking and so on. Here, you will learn that there are differences in the potential for creativity across individuals and the manner in which creativity is expressed. Some are highly creative and others are not so creative. Some may express creativity in writing, still others in dance, music, poetry, science and so on. Manifestations of creativity can be observed in a novel solution to a problem, an invention, composition of a poem, painting, new chemical process, an innovation in law, a breakthrough in preventing a disease and the like. Despite differences, one common element among these is the production of something new and unique. We generally think of creativity in terms of creative persons like Tagore, Einstein, C.V. Raman, Ramanujan etc. who have made outstanding contributions in different spheres.

In recent years, our understanding of creativity has broadened. Creativity is not just limited to a selected few — the artist, the scientist, the poet or the inventor. An ordinary individual who is engaged in simple occupations like pottery, carpentry, cooking, etc. can also be creative. However, it has been said that they are not working at the same level of creativity as an eminent scientist or a writer. Hence, we can say that individuals vary in terms of the level and the areas in which they exhibit creativity and that all may not be operating at the same level.

Einstein's theory of relativity is an example of the highest level of creativity which implies bringing out altogether new ideas, facts, theory, or a product. Another level of creativity is working on what has already been established earlier by way of modifications, by putting things in new perspectives or to new use. Research literature suggests that children begin to develop their imagination during the early years of childhood but they express creativity mostly through physical activities and in non-verbal ways. When language and intellectual functions are fully developed and store of knowledge is adequately available, creativity is expressed through verbal modes too. Those who are outstanding in their creativity may give an indication about the directionin which their creativity lies through their self-chosen activities. In some cases, however, opportunities need to be provided before they can manifest their hidden potential for creativity. How do we explain variations in the potential for creativity? As in the case of other mental and physical characteristics, such variations can be attributed to the complex interaction of heredity and environment. There is no disagreement that creativity is determined by both heredity and environment. Limits of the creative potential are set by heredity; environmental factors stimulate the development of creativity. How much of the creative potential can be realized, when and in what specific form and direction is largely determined by environmental factors such as motivation, commitment, family support, peer influences, training opportunities, etc. Although no amount of training can transform an average person to the level of Tagore, Shakespeare, etc. but it is also true that every individual can raise her/his level of creative potential beyond its present level.

The term 'creativity' has been defined in many ways. Some of these definitions are as follows:

Stagner and Karwoski(1973): "Creativity implies the production of a totally or partially novel identity".

Bartlett (1958): "Creativity is an adventurous thinking or a getting away from the main track, breaking out of the mould, being open to experience and permitting one thing to lead to another".

Spearman (1931): "Creativity is the power of the human mind to create new contents by transforming relations and thereby generating new correlates".

THE COMPONENTS OF CREATIVITY

Cognitive

- Flexibility- Maintain openness to unique and novel experience.
- Decision Making- Make thoughtful choices that support creative efforts.

Social & Motivational

- Communication and Self Expression- Communicate ideas and true self with confidence.
- Motivation- Demonstrate internal motivation to achieve a meaningful goal.
- Collaboration- Develop social skills that foster creative team work.

Physical

- Action & Movement- Boost creative potential through physical activity.

NATURE OF CREATIVITY

a. Creativity is not confined to any individual: Creativity is not confined to any individual, group of individuals, caste, colour or creed. It is not bound by the barriers of age, location or culture.

b. Creativity is innate as well as acquired: Although many research findings and incidents favour the suggestion that creativity is a God given gift and natural endowment, the influence of cultural background, experiences, education and training in the nurturing of creativity cannot be ruled out. Thus one's creativity may be correctly said to be a function of natural endowment as well as its nurturing. It is a combination of responses or ideas in novel ways.

b. Creativity is adventurous and open thinking: Creativity is not a product of the stereotyped, rigid and closed thinking. It encourages and demands complete freedom to accept and express the multiplicity of responses, choices and ways of action.

d. Creativity carries ego involvement: There is complete involvement of one's ego in the creative expression. One's individuality and identity are totally merged in one's creation. Here 'I' is given more weightage

e. **Creativity has a wide scope:** Creative expression is not restricted by any limits or boundaries. It covers all fields and activities of human life in any of which one is able to demonstrate creativity by expressing or producing a new idea or object.

FOSTERING CREATIVITY:

Researches in the field of creativity have suggested special techniques and methods for fostering creativity among children.

a. **Brainstorming:** Brainstorming is a strategy or technique for allowing a group to explore ideas without judgment or surety. In practice, the students may be asked to sit in a group for solving a problem, and attack them without any inhibition from any angle with questions having number of ideas and solutions. The students are asked to suggest ideas as rapidly as possible.

b. **Use of teaching models:** Some of the teaching models may prove quite beneficial in developing creativity among children.

c. **Use of gaming technique:**Gaming techniques in a playful spirit, help the children in the development of creative traits. These techniques provide valuable learning experiences in spontaneous and evaluative situation. Both verbal and non-verbal stimulus materials are used in such techniques.

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

CREATIVITY AND INTELLIGENCE

One important debate in understanding the variations in creativity has been the relationship of creativity with intelligence. Let us take an example of two students in a class. Sunita is regarded by her teachers as an excellent student. She does her work on time, scores the highest grades in her class, listens to instructions with care, grasps quickly, reproduces accurately but she rarely comes out with ideas which are her own. Rita is another student who is just average in her studies and has not achieved high grades consistently. She prefers to learn on her own. She improvises new ways of helping her mother at home and comes up with new ways of doing her work and assignments. The former is considered to be more intelligent and the latter as more creative. Thus, a person who has the ability to learn faster and reproduce accurately may be considered intelligent more than creative unless s/he devises new ways of

learning and doing. Terman, in the 1920s, found that persons with high IQ were not necessarily creative. At the same time, creative ideas could come from persons who did not have a very high IQ. Other researchers have shown that not even one of those identified as gifted, followed up throughout their adult life, had become well-known for creativity in some field. Researchers have also found that both high and low level of creativity can be found in highly intelligent children and also children of average intelligence. The same person, thus, can be creative as well as intelligent but it is not necessary that intelligent ones, in the conventional sense, must be creative. Intelligence, therefore, by itself does not ensure creativity.

Researchers have found that the relationship between creativity and intelligence is positive. All creative acts require some minimum ability to acquire knowledge and capacity to comprehend, retain, and retrieve. Creative writers, for example, need facility in dealing with language. The artist must understand the effect that will be produced by a particular technique of painting, a scientist must be able to reason and so on. Hence, a certain level of intelligence is required for creativity but beyond that intelligence does not correlate well with creativity. It can be concluded that creativity can take many forms and blends. Some may have more of intellectual attributes, others may have more of attributes associated with creativity. But, what are the attributes of a creative person? You may like to discuss the attributes which are common to all kinds of creative persons. Creativity tests came into existence to assess variations in terms of the potential for creativity in contrast to intelligence. A general feature of most of the creativity tests is that they are open-ended. They permit the person to think of different answers to the questions or problems in terms of her/his experiences, whatever these may have been. These help the individual to go in different directions. There are no specified answers to questions or problems in creativity tests.

Therefore, there is freedom to use one's imagination and express it in original ways. Creativity tests involve divergent thinking and assess such abilities as ability to produce a variety of ideas, i.e. ideas whichare off-the-beaten track, ability to see new relationships between seemingly unrelated things, ability to guess causes and consequences, ability to put things in a new context, etc. This is contrary to the tests of intelligence which mostly involve convergent thinking. In tests of intelligence, the person has to think of the right solution to the problem and the focus is on assessing abilities such as memory, logical reasoning, accuracy, perceptual ability, and clear thinking. There is little scope for the expression of spontaneity, originality, and imagination. Since expressions of creativity are varied, tests have been developed using different stimuli like words, figures, action, and sounds. These tests measure general creative thinking

abilities like ability to think of a variety of ideas on a given topic/ situation, alternative ways of looking at things, problems or situations, to guess causes and consequences, to think of unusual ideas to improve and to use common objects, ask unusual questions and so on. A few investigators have also developed tests of creativity in different areas such as literary creativity, scientific creativity, mathematical creativity, etc. Some of the famous psychologists who have developed creativity tests are Guilford, Torrance, Khatena, Wallach and Kogan, Paramesh, Baqer Mehdi, and Passi. Each test has a standardised procedure, a complete set of manual, and interpretation guide. These can be used only after extensive training in administration and interpretation of test scores.

3.7 Individual Differnces And Its Educational Implications For Children With Disabilities

INDIVIDUAL DIFFRENCES

The evidence for hereditary influences on intelligence comes mainly from studies on twins and adopted children. The intelligence of identical twins reared together correlate almost 0.90. Twins separated early in childhood also show considerable similarity in their intellectual, personality and behavioural characteristics. The intelligence of identical twins reared in different environments correlate 0.72, those of fraternal twins reared together correlate almost 0.60, and those of brothers and sisters reared together correlate about 0.50, while siblings reared apart correlate about 0.25. Another line of evidence comes from the studies of adopted children, which show that children's intelligence is more similar to their biological rather than adoptive parents. With respect to the role of environment, studies have reported that as children grow in age, their intelligence level tends to move closer to that of their adoptive parents. Children from disadvantaged homes adopted into families with higher socioeconomic status exhibit a large increase in their intelligence scores. There is evidence that environmental deprivation lowersintelligence while rich nutrition, good family background, and quality schooling increases intelligence. There is a general consensus among psychologists that intelligence is a product of complex interaction of heredity (nature) and environment (nurture). Heredity can best be viewed as something that sets a range within which an individual's development is actually shaped by the support and opportunities of the environment.

All persons do not have the same intellectual capacity; some are exceptionally bright and some are below average. It has been noticed thatabout 2 per cent of the population have IQ above 130,and a similar percentage have IQ below 70. The persons in the

first group are called intellectually gifted; those in the second group are termed intellectually disabled. These two groups deviate considerably from the normal population in respect of their cognitive, emotional, and motivational characteristics.

Variations of Intelligence

Intellectual Deficiency

On the one hand are the gifted and creative persons we discussed briefly earlier. On the other hand, there are children who face enormous difficulty in learning even very simple skills. Those children who show intellectual deficiency are termed as 'intellectually disabled'. As a group, there is wide variation among the intellectually disabled. The American Association on Mental Deficiency (AAMD) views intellectual disability as "significantly sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during the developmental period".

This definition points to three basic features. First, in order to be judged as intellectually disabled, a person must show significantly sub-average intellectual functioning. Persons having IQs below 70 are judged to have sub-average intelligence. The second relates to deficits in adaptive behaviour. Adaptive behaviour refers to a person's capacity to be independent and deal effectively with one's environment. The third feature is that the deficits must be observed during the developmental period that is between 0 and 18 years of age. Individuals who are categorized as having intellectual disability show significant variation in their abilities, ranging from those who can be taught to work and function with special attention,to those who cannot be trained and require institutional care throughout their lives. You have learnt earlier that the mean IQ score in the population is 100. These figures are used to understand the categories of intellectually disabled.

The different levels of intellectual disability are: mild (IQs 55 to approximately 70), moderate (IQs 35–40 to approximately 50– 55), severe (IQs 20–25 to approximately 35–40), and profound (IQs below 20–25). Although the development of people with mild disability is typically slower than that of their peers, they can function quite independently, hold jobs and families. As the level of disability increases, the difficulties are strongly marked. The people with moderate disability lag behind their peers in language and motor skills. They can be trained in self-care skills, and simple social and communication skills. They need to have moderate degree of supervision in everyday tasks. Individuals with profound and severe disability are incapable of managing life and need constant care for their entire lives.

EDUCATIONAL IMPLICATIONS FOR CHILDREN WITH DISABILITIES

Education plays an important role to provide opportunities for the development of the potentialities of individuals to contribute for the development of the nation. It is necessary to make separate arrangement for the education of children with disabilities.

1. Children with special needs do not benefit from regular classroom teaching. They need different treatment in learning. If they are attended properly they may develop behaviour problems which may cause harm to the individual and to the society. So it is imperative to make special arrangements for their education.
2. The second need of organizing special education is for the intellectually and physical disabled who find it difficult to adjust in home and society. Education for these children aims to develop confidence and competencies in disabled children to earn their livelihood independently.
3. Special education will solve the problems which disabled children face in regular school programs.
4. Attempts should be properly and honestly made for the adequate structuring and improving the existing environmental set-up. It provides assistance, care and guidance for children with disabilities.

The task requires the joint efforts of all who are concerned with the brought up, education and welfare of the children. The parents, members of the family, teachers, guidance and counseling workers, educational authorities, social and community agencies etc. all should join hands for providing due acre, attention and remedial educational programs to the learning disabled. They should help them in acquiring desirable personality traits in overcoming their deficiencies with regard to their educational progress and behavioral drawbacks.

3.8 Let us sum up

3.9 Unit End Exercise

1. What is perception?
2. How does sensation differ from perception?

3. What is meant by law of pragnanz?
4. What is meant by depth perception?
5. How does attention differ from interest?
6. What are the objective factors of attention?
7. What do you mean by STM & LTM?
8. What is a concept?
9. What is reflective thinking
10. What is intelligence?
11. What do you mean by multiple intelligence?
12. What is meant by creativity?

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Unit-4 □ Motivation, Learning and Personality

Structure

4.1. Introduction

The major role of a teacher is to develop motivation, curiosity & self-efficacy among the learners which ultimately leads to the strong desire to understand what they learn. How does a student transform into a motivated learner, what should be role of schooling, what are the theories of motivation which can explain the development of motivation will be discussed in the unit.

Learning is the central focus of Educational Psychology. Learning can be defined as a permanent change in one's behavior, knowledge, thinking skills as a result of experience. A number of theories & approaches have been developed, such as behavioral, cognitive & social. According to behaviorism, behavior is directly observed. According to cognitive theories, learning involves mental processes, like thinking, remembering, feeling, motivation that cannot be observed, whereas social learning theory describes that learning takes place in a social situation involving cognitive processes.

Personality refers to the distinctive thoughts, emotion & behavior that characterize the way an individual adapts to this world. It means the different qualities of a person's character that makes him/her different from other person. Different theories of personality have been developed by the psychologists to understand its nature & concept. These theories are Freudian, Neo- Freudian, Trait theories & Humanistic Theories. Assessment of personality is very important to understand the qualities of person which helps in giving educational & vocational guidance and to provide proper counseling.

Though the students exhibit exceptionality in the classroom, but some have been identified as students with disabilities. There are wide ranges of disabilities both physical & mental, which have learning problems. To meet the special needs of these children, selection of appropriate curriculum materials, teaching-learning strategies are necessary to provide a supportive classroom environment. Many instructional procedures that have been found to be effective with disabled students will be discussed in the unit.

4.2 Objectives:

After reading this unit, you should be able to:

- Understand the concept, definition & theories of motivation.
- Able to use strategies for motivating students.
- Become acquainted with different learning theories.
- Develop understanding of the differences between classical & contemporary learning theories.
- Understand concept, definition and principles of personality development.
- Can assess personality of classroom learners.
- Develop understanding of different personality theories.
- Identify & design teaching-learning strategies for students with disabilities.

4.3 Concept of motivation:

Motivation is a critical aspect of teaching & learning. Unmotivated student won't expend the necessary effort to learn. Highly motivated students are eager to attend school & absorbed in the learning process. Motivation involves the processes that

energize, direct and sustain behavior. That is motivated behavior is energized, directed & sustained.

Definition of motivation:

Motivation is defined as an internal state that arouses us to action, pushes us in particular directions & helps us engaged in certain activities. Motivation is an important psychological construct that affects our learning & performance in different ways:

- Motivation increases the energy & activity to such an extent which direct an individual to engage in an activity intensively or half-heartedly.
- Motivation directs an individual towards certain goal.
- Motivation affects learning strategies & cognitive processes that an individual employs.

Other aspects of motivation may be described as intrinsic & extrinsic motivation. Intrinsic or Internally oriented motivation means when students desire to learn internally without any external incentives. But when students are motivated through external inducements, namely prizes, marks & other rewards, they are said to be externally motivated. Intrinsic motivation creates an ideal state which initiates the learners to be self-directed, maintain interest in what they are learning.

Theories of motivation:

a) **Maslow's Need Hierarchy Theory** – Abraham Maslow's concept of self-actualization, is a growth concept, students move towards the goal as they satisfy their basic needs. It requires the satisfaction of hierarchy of needs. These needs are:

I. Physiological needs: Hunger, sleep is basic physiological needs, unless these are satisfied, learning potential of students will be lowered.

II. Safety needs: These are needs of security, protection, freedom from fear & anxiety. Student, who is afraid of school, peers & teachers, which affects his classroom performance. They also need safety & security from their parents.

III. Love & belongingness needs: It refers to need for family & friends. Students who feel alone & lack of belongingness, are not motivated to classroom learning.

IV. Esteem needs: Everyone wants a favorable judgment and feeling of appreciation from others based on his achievement. Our sense of competence develops with

the appreciation from others. Teachers should provide students the opportunity to satisfy this need.

V. Need for self-actualization: In spite of the satisfaction of lower needs, students feel restless unless they are encouraged to recognize their potential & feel competent as well as fulfilled.

b) **Attribution theory of motivation:** According to Weiner, when students will either succeed or fail, they search for the reasons of success or failure. We tend to attribute our performance to one of four elements: ability, effort, task difficulty & luck.

I. Ability – When students have a history of failure, they make assumption that they lack ability. There is a feeling of incompetence that lowers their initiatives. It affects their self-efficacy. On the other hand, successful students develop a sense of self-efficacy which enhances motivation.

II. Effort – Students judge their effort by how well they did a particular task. Successful students believe that they tried harder than unsuccessful students.

III. Luck – There is a tendency to attribute failure and success to luck. Those students who have a little faith on their ability, attributes then success to luck. Success in this case, will not increase their effort.

IV. Task difficulty – If many succeed, the task is perceived as easy & vice-versa. An interesting phenomenon is that, if one consistently succeeds, where other failed, the student will attribute his success to ability. But when most of the students succeed in a task, then the source of success is seen in the task.

c) **McClelland's theory of Achievement Needs** – Achievement (n-Ach), Power (n-P) and Affiliation (n-Aff) are three important needs that help to explain motivation.

I. Achievement need – The drive to excel, to achieve, to excel in relation to a set of standard, strive to succeed.

II. Power need – the need to make others behave in a way that they could not have behaved otherwise.

III. Affiliation need – The desire to make friendly and close interpersonal relationships.

d) **Skinner's Reinforcement Theory** – Behavior is controlled by consequences. Reinforces control behavior – any consequence, when followed by response, increases the probability of behavior repetition.

Traditional & contemporary learning theories:

Learning is a process through which experience causes permanent change in behavior or knowledge. The definition explain that the changes resulting from learning are in the individual's behavior or knowledge, Traditional theories, emphasize on the change of behavior, whereas contemporary theories emphasize on the change of knowledge. Contemporary or cognitive views of learning, who focus on the change in knowledge, believe that learning is an internal mental activity that cannot be observed directly. Cognitive psychologists are interested in unobservable mental activities, such as thinking, remembering, solving problems etc. The classical or behavioral view assumes that the outcome of learning is the change of behavior that can be externally observed. Two behavioral views, classical conditioning & operant conditioning will be discussed in the sub-unit. Four main cognitive approaches to learning: social cognitive, cognitive information processing, cognitive constructivism and social constructivist theories will be discussed.

4.4. Classical and Contemporary Learning Theories: Behavioural, Cognitive and Social

Behavioral theory of learning

i. Classical conditioning theory

Classical conditioning is a type of learning, in which an organism learns to associate stimuli. Russian Physiologist, Ivan Pavlov was interested to observe the way that a dog learns to associate a number of stimuli, such as the sight of the food, the sight of the individual who brought the food and the sound of the door closing when the food arrived. Here the dog's association between the sight of the food and sound of the door is an important type of learning, called Classical conditioning.

In Classical conditioning, the dog learnt to associate between natural and unconditioned stimulus (food) and neutral stimulus (sound of bell). It needs two types of stimuli and two types of responses: unconditioned stimulus (US), unconditioned response (UR), conditioned stimulus (CS) and conditioned response (CR).

In one of his first experiment, Pavlov began by sounding a tuning fork and observing the dog's response. As expected, there was no salivation. Therefore the sound of the tuning fork was a neutral stimulus as it brought forth no salivation. Pavlov, then fed dog and the response was salivation.

Diagrammatic representation of Pavlov's experiment

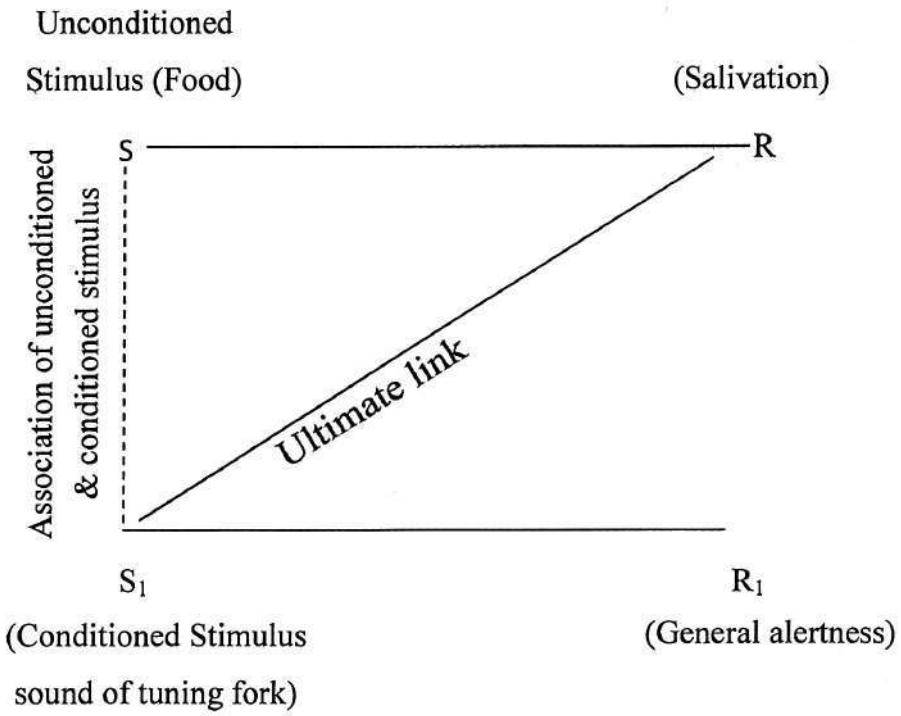

Fig .1 Classical Conditioning

ii. Operant conditioning

In operant conditioning, the consequences of behavior/response lead to the changes in the probability of the occurrence of the behavior.

The theory of operant conditioning was developed by B.F.Skinner, where consequences - rewards or punishment – are contingent on the organism's behavior.

Reinforcement and punishment

Reinforcement is a consequence (reward) that increases the probability that a behavior will occur. In contrast, punishment is a consequence that decreases the probability of the occurrence of behavior. Reinforcement may be positive and negative. Positive reinforcement based on the principle that the frequency of a response increases because it is followed by a rewarding stimulus. Negative reinforcement based on the principle that the frequency of a response increases because an unpleasant stimulus is removed.

The schedule of reinforcement

Skinner provided the idea of planning schedule of reinforcement for conditioning the operant behavior of the organism. The schedules may be divided into:

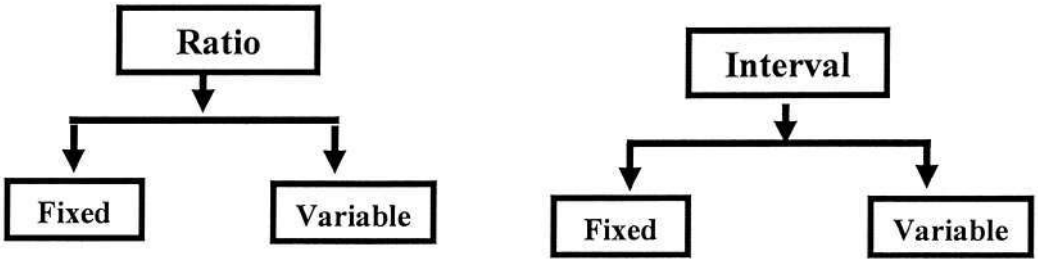

Fig.2 Diagram of Reinforcement Schedule

1. In fixed ratio reinforcement schedule, reinforcement is given after a fixed number of responses. For example, a rat may be given a pellet of food after a certain number of lever presses.
2. In variable ratio reinforcement schedule, reinforcement is given at variable number of responses.
3. In fixed interval schedule, a reinforcement is given to an organism after a set interval of time, e.g. every 3 minutes or every 5 minutes,
4. In variable interval schedule, reinforcement is given at variable interval of times. The organism does not know when it is going to be rewarded and remains motivated throughout the learning process.

Skinner conducted a number of experiments to ascertain the consequence of a reward in terms of repetition and maintenance of behavior. He concluded that, "behavior is shaped by its consequences." The occurrence of such behavior was named operant behavior and the process of learning, that plays a part in learning such behavior, was termed by him as operant conditioning,

In one of his experiments, skinner placed a hungry rat, in box (designed by skinner). In this experiment, pressure on the bar in a certain way by the rat could result in the production of a click and the emergence of the food pellet. The rat was rewarded for each proper pressing of the lever. The lever pressing response to having been rewarded, the rat repeated the response and was rewarded again. Thus the rewarding of the

response increases the probability of the occurring of level pressing response. In this way the rat learned to press the lever and rewarded.

Cognitive theories of learning:

The cognitive views of learning is a general approach that views learning as an active mental process of acquiring, remembering and using knowledge, whereas behavioral theories do not give adequate attention to cognitive processes involved in learning.

The cognitive and behavioral views in their assumption about what is learned. According to the cognitive view, knowledge is learned and change in knowledge makes change in behavior. Both behavior and cognitive theorists believe that reinforcement is important for learning, but for different reasons. According to behaviorist, reinforcement strengthens behavior, but cognitive theorists view reinforcement as a source of feedback about what is likely to happen if behaviors are repeated or changed- as a source of information. Older cognitive views emphasized the acquisition of knowledge, but newer approaches stress on the construction.

Different cognitive theories which will be discussed in the subunit are – social cognitive learning theory, cognitive information processing theories, and cognitive constructivism theories.

i. Social-cognitive approaches to learning:

Bandura's social cognitive learning theory states that social and cognitive factors, as well as behavior play important roles in learning. Bandura developed the reciprocal model which consists of three factors: behavioral, cognitive and environmental. Bandura believed that, behavioral views overlooked the importance of social influences on learning. Bandura has given importance on vicarious learning which is the process of learning by observing the behavior of others (observational learning). When people learn by watching, they must be focusing their attention, constructing image, remembering, analyzing and making decisions that affect learning. Observation can be a very effective learning process. According to Bandura, observational learning includes four elements: paying attention, retaining information, producing behavior (motor reproduction) and being motivated to repeat that behavior.

Attention : In order to learn through observation, the learners need to pay attention. In teaching, a teacher needs to draw attention by highlighting important points. Students are most likely to attend high student's model than low student models. In most cases, teachers are high-status models for students.

Retention : To reproduce a model's action, students must code information and keep it in memory so that it can be retrieved. A video with colorful character, demonstrating the importance of considering other students' feeling might be remembered better than if the teacher just tells the students to do this. Retention can be improved by mental rehearsal (imagining imitating behavior) or by actual practice. In the retention phase, practice helps us remember the elements of the desired behavior, such as sequence of steps.

Producing behavior (motor reproduction):

Learners may attend to a model, code in memory what they have been seen but they are not able to reproduce the model's behavior because of limitation in their motor ability. Sometimes it needs a great deal of practice, feedback and coaching before we can reproduce behavior of the model. In practice phase, behavior becomes smoother.

Motivation : In observation learning, we may acquire a new skill or behavior through observation, but we may not perform that behavior until we are motivated to or get some incentive. Reinforcement plays an important role in observational learning. If we anticipate being reinforced for imitating the behavior, we will be motivated to pay attention, remember and reproduce the behavior.

According to Bandura, three forms of reinforcements can encourage observational learning. The learners may reproduce the behavior of the model through direct reinforcement. But reinforcement need not to be direct it may be vicarious reinforcement. The learner may simply by observing others being reinforced for performing the behavior of the model, it increases his/her production of that behavior.

The other form of reinforcement is self-reinforcement. This type of reinforcement is important for student and teacher.

According to Bandura, several factors play a role in observational learning. Such as the developmental level of the learners. When the children grow older, they are able to focus attention for longer periods of time, use memory strategies to retain and are motivated to reproduce the behavior. The second factor that influences learning is the status of the model. Children tend to imitate a model that is competent, prestigious and enthusiastic. Thirdly, by watching others, children learn what behavior are appropriate for ourselves, so models who are seen as similar are more readily imitated.

Finally observers are more likely to learn from models if the observer has a high level of self- efficacy that is, if they believe they are capable of doing the actions needed to reach the goal. Self efficacy is a person's sense of being able to deal effectively with a particular task.

ii. Cognitive information processing theory

Information processing theory focuses on how children process information through attention, memory, thinking and other cognitive process. The stage concept of memory was developed by Atkinson and Shiffrin (1968). According to Atkinson and Shiffrin, memory involves a sequence of sensory memory, short-term memory and long-term memory stages. The information in sensory memory is retained only for a brief instant. However, some information, specially that which we pay attention, is transferred to short-term memory, where it can be retained for about 30 seconds. Atkinson and Shiffrin claimed that the longer information is retained in short-term memory through the use of rehearsal, the greater its chance of getting into long-term memory. The information in long-term memory can be retrieved back into short-term memory.

Role of perception and attention

Perception is the process of assigning meaning to a stimulus. We pay attention to only one of the incoming information as we select the information based on certain characteristics – colour, size and certain qualities and ignore others. The type of information enters from sensory memory to short-term memory when it becomes the focus of attention. Sensory impressions which do not engage our attention faded away and disappear. The learner selectively perceived only a part of what is received in sensory register, what they perceive is related to their prior experiences, their feeling regarding the particular stimulus, motivation of the learner and direction given to them in a particular situation. Thus a part of sensory information is transformed and entered into the short-term memory.

Short-term memory

The information stored in STM, held there for as long as 30 seconds. It is sometimes referred to as consciousness. STM is sometimes called working memory, as working memory contains what we are thinking about at the moment.

Now the question is, how much information is hold by this memory system? It can retain only five to nine (7 ± 2) separate pieces of information, which is known as memory span. We can increase the information capacity of STM, by grouping the incoming information into large chunks, like the practice of saying telephone numbers as a series of two digit number (e.g. 25 56 08 77) giving fouritemsto retain rather than eight. Because of the process of chunking, STM can hold a large amount of information by grouping them into meaningful chunks.

Information in the STM is rapidly lost. Information must be kept activated by the process of rehearsal or repetition (aloud and silently). This type of rehearsal is called

'maintenance rehearsal' as it is useful for retaining something. Elaborative rehearsal is the process of connecting the information with something we already know, with knowledge retained in long-term memory.

Information is lost from STM, two processes have been proposed for this.

1. Decay
2. Displacement

Long-term memory

Some of the information of STM is processed and transformed to the LTM. Information in STM gets transferred to LTM through the process of rehearsal. Elaborative rehearsal involves extracting the meaning of information and then linking the new information to the material already exist in LTM. The levels of processing view suggests that the deeper the level of processing that takes place when we encounter new materials, the more likely that the materials are to enter LTM.

Organization is the second elements of processing through which pieces of information are organized. The more carefully, we organize information, the more likely that we will be able to retrieve it later.

The third element of processing that affects learning is the context, context means the physical and emotional background associated with an event, such as place of learning, mood of the learner etc are all associated with learning.

Semantic and Episodic memory

Everything that we know is stored in LTM. Such as meaning of a word or any formula of mathematics, psychologist call this portion of LTM as semantic memory. Still other portion of LTM is more personal and specific, events that are personally experienced, e.g. my visit to Digha at Puja vacation, this personal kind of memory is called episodic Memory. Events in the episodic memory are related to time and place. Events in the semantic memory is not tied to specific time and place, but is of a more general and abstract nature.

Forgetting and Long-Term Memory

Everything stored in LTM cannot be remembered. Forgetting it due to interference. Interference may come from two directions. First, materials may interfere with materials already exist in LTM, is called retroactive interference. Secondly, interference may come from other direction, with the old information blocking a similar new memory-proactive interference. Retroactive interference seems to be due to storage loss, new

information pushes the old but Proactive interference is due to retrieval problems. The old and new memories are both there, but they may not be retrieved by the same cues. Material is lost from memory simply because it is not processed deeply.

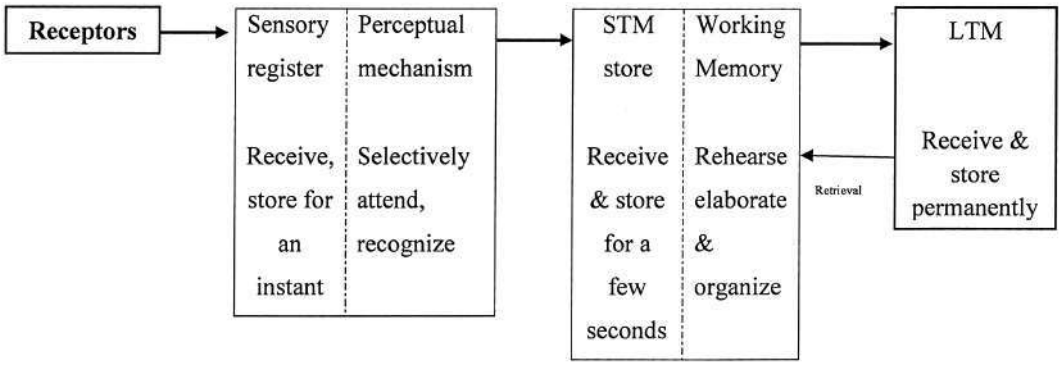

Fig.3 Phases & mental processes of Human information Processing

iii. Cognitive constructivism

In the traditional classroom, there is an emphasis on the transmission of knowledge, and meaning is conveyed, via the spoken and written words of teachers (Wordsworth, 1996). The teacher decides which topics and skills are to be taught and then teacher teaches directly and intact.

But traditional orientation to teaching are getting a new look. Contemporary researches in psychology suggest difficult roles for both teachers and students. These new roles have been highlighted by the constructivist movement in education.

The constructivist perspective emphasizes that learning occur when learners actively engage their cognitive structure in scheme building experiences. From the constructivist perspectives, learners try to make sense of the world by relying on their pre-existing schemas. Learning is aided by social interaction with peers and teachers and via real world experiences.

The constructivist believes that cognitive structures enable learners to use past experiences. Further, they believe that the cognitive structure can be altered, as described by Piaget, through the process of accommodation. When an individual is confronted to a new experience, he seeks to assimilate the experiences into an existing scheme. But when the newly encountered experience proves too discrepant, we modify our existing schemas. Some educational and developmental Psychologists have referred to Piagetian constructivism as 'first wave constructivism'.

Constructivist views of learning

There are two forms of constructivist views: psychological and social constructivism. Psychological constructivists are dealing with how individual build up certain elements of their cognitive and emotional apparatus'. (Philips, 1997,p.153). These constructivists are interested in individual knowledge, beliefs, self-concept, so they are sometimes called individual constructivism. According to Mayer (1996), the most recent information processing theories are constructivist. Therefore in the first wave constructivism the focus is on the individual and psychological sources of knowing, as in Piaget's theory.

In the second wave of constructivism, the focus is on the social and cultural sources of knowing, as in Vygotsky's theory. Vygotsky believed that in social interaction, cultural tools shape individual's development and learning. As his theory relies heavily on social interactions and cultural context to explain learning, most psychologists classify Vygotsky as social constructivist.

Views of cognitive constructivism may be explained through six points.

1. We cannot know objective reality – we interpret everything in the light of our past experiences and construct our subjective understanding of the experience.
2. Knowledge is subjective- As two people may not have same physiology and same experiences, therefore no two people construct the knowledge in the same way.
3. Knowledge of two people is shared to the extent that their construction function in the same way

   Two persons may have common understanding but they may not be the exact replica of each others knowledge. The knowledge construction may not be the same.
4. Knowledge is constructed through the process of adapting to the events and ideas one encounters-

   Students are motivated to learn because of 'cognitive conflict'. It means the conflict between new idea and already existing ideas. According to Piagetian perspective, we feel mentally uncomfortable by this cognitive conflict and want to resolve the conflict through the process of adaptation of new idea with previously existed ideas. As a result, existing knowledge structure is reorganized and new knowledge structure is constructed.
5. Knowledge construction is influenced by the symbols and materials one uses in his environment.

According to constructivists, materials and symbols that are available in one's environment, affect the knowledge construction. Different materials highlight different aspects of the information, may give rise to different interpretation and thus different cognitive construction he experiences.

6. Readiness to learn indicates different meanings in constructivism.

An individual is ready to learn some concepts when his cognitive structure is ready to incorporate the new concept. Though the knowledge may be incorrect but there must be some alteration in his existing knowledge structure. According to Vygotsky, different students need different assistance to learn. The amount & type of assistance required by him, indicates the kind of cognitive construction he has.

On the basis of these six tenets, it can be said that constructivists differ on their emphasis on internal & external factors in the development of cognitive constructions.

iv. Social: Vygotsky's Social Constructivism

Vygotsky believed that social interaction, shape individual's development & learning. Through participation in activities with others, individual acquires knowledge of the world. As his theory emphasize on social interactions and the cultural content to explain interactions and the cultural content to explain learning, he is recognized as social constructivist.

Vygotsky represented unique & influential ideas about the relation between learning & development. These ideas reflect that cognitive functioning has social origins. One of Vygotsky's unique ideas was his concept of the 'Zone of Proximal Development'.

'Zone of Proximal Development' is Vygotsky's term for the range of tasks that are too difficult for children to master alone but that can be learned with guidance & assistance from adults or more skilled children. Thus the lower limit of the ZPD is the level of problem solving reached by the child working independently.

The upper limit is the level of additional responsibility the child can accept with the assistance of an able instructor. According to Vygotsky, learning must be matched with a pupil's developmental level, which may be identified by an intelligence test score. For example, after administering a Stanford Binet Intelligence test, we find that IQ score of a student is 110, which would be s student's current level of mental development. It means that student can only work at this level. Vygotsky argued that with a little help, the student might be able to do work that they cannot do on their own. Therefore Vygotsky's concept of ZPD indicates distance between a child's actual development level and a higher level of potential development with adult guidance.

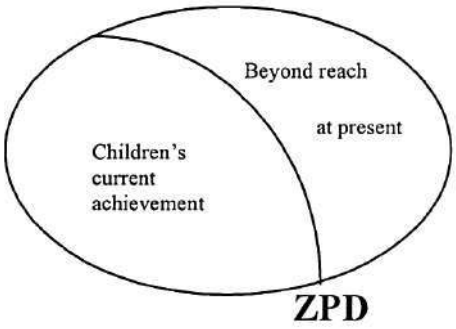

Fig.4 Zone of Proximal Development

Scaffolding – The idea of ZPD leads to the notion of scaffolding. Scaffolding is the way of helping students move from initial difficulties with a topic to a point, where, with help, they come to perform the task independently. Help, usually from adults, enables a child to move to a higher level of accomplishment.

Teaching strategies for applying Vygotsky's Theory:

1. Use the zone of proximal development.
2. Use scaffolding.
3. Use more skilled peers as teachers.
4. Encourage collaborative learning.
5. Consider cultural context of learning.
6. Assess ZPD, not IQ.
7. ZPD indicates that learning is interpersonal

4.5. Concept, definition & principles of personality development

Concept, definition & principles of development

Personality is all that a person is. It is totally of one's behavior towards oneself as well as others. It includes everything about a person; his physical, emotional, social & spiritual make-up, therefore, personality signifies something more than mere appearance or outward behavior. Personality is the sum of biological innate and acquired disposition.

Scholars have defined personality in many ways:

J.B Watson,(1930), the famous behaviorist, defined personality in the words:

'Personality is the sum of activities that can be discovered by actual observation over a long enough periods of time to give reliable information'(1930) .

Morton Prince, accepting the role of heredity and environment, defines as:

' personality is the sum total of all the biological innate disposition, impulses, tendencies, appetites and instincts of the individual and the disposition and the tendencies acquired by experience'(1929).

After evaluating49 definitions, Allport summarizes his own concept in the following words:

'Personality is a dynamic organization within the individual of those psycho-physical systems that determine his unique adjustment to his environment'. (1948, p.28)

Though the definition of Allport is comprehensive, contemporary psychologists, R.B. Cattle and Eysenck opined that the definition emphasizes on the theoretical and behavior aspects of personality.

The definition given by R.B. Cattle: 'Personality is that which permits a prediction of what a person will do in a given situation.' (1970, p. 386)

According to Eysenck: 'Personality is more or less stable and enduring organization of a person's character, temperament, intellect and physique, which determine his unique adjustment to the environment'(1971,p.2)

Eysenck, in his definition, mentioned four aspects of personality:

'Character' denotes willing aspect, 'Temperament' is affective aspect of individual, 'Intellect' is the cognitive behavior and 'physique' is bodily configuration or neuro – endocrine endowment.

Personality development

Personality development is the development of an organized pattern of behaviors and attitude that makes a person distinctive. Personality development occurs by the ongoing interaction of temperament, character and environment.

Personality development may be described from different perspectives:

Evolutionary perspective

Life span perspectives

Influencing factors – Genetic

Environmental
Gene- environment interactions.

Evolutionary perspective

The evolutionary perspectives traces personality and individuality back to when the early humans were learning how to function in complex social groups. Many specialists from different fields have a general agreement that early human saw themselves as a part of the group to which they belonged, rather than seeing themselves as individuals with individual personality. These early humans then continued to develop personality and individuality, which stemmed from their group and social interactions, they encountered individual life and thus personality arose from collective life.

Lifespan perspective

Classic theories of personality, such as Freudian, Post-Freudian theory, including developmental stage theories & type theories, held the perspective that Personality development occurs in childhood and that personality is stable by the end of adolescence. The lifespan perspective of personality is based on the plasticity principle that personality traits are open systems that can be influenced by environment at any age.

Influencing factors

Genetics – Twin studies have demonstrated that an individual is born with hereditary trait that determines his personality. But hereditary trait may change depending on an individual's environment.

Environment- It is found that the shared family environment has relatively no effect on Personality development and that similarity between relatives is almost due to shared genetics. Although the shared environment (including parenting style, beliefs of parents, socio-economic status, neighborhood, nutrition, school attended, number of books in the house etc) may have lasting impact at the extremes of parenting practice. Most personality researchers have concluded that the majority of 'average expectable environment' do not have an effect on Personality development.

Gene – environment interaction

Interaction between genetic predisposition & the environment are major factor in Personality development. The principle summarizes how gene-environmental interactions maintain and reinforce the continuity of personality throughout the life-span.

Development of personality takes place from two general influences- biological & situational. Personality emerges from the interaction of biological organism with a

cultural and social world. Biological factors set a limit within which the personality will develop. The actual shaping of personality takes place under the influence of parents, the way they treat and bring up children, follow social practices & provide the type of education. The influence of environment is indicated by the effect of social customs, child rearing practices & relationship with parents.

4.6 Personality Theories

Psychoanalytic theories- Freudian & Neo- Freudian

The famous psychologist, Sigmund Freud is said to be the profounder of this school of thought. The thought propagated by Freud through his Psycho-analytic approach may be stated as follows:

1. Two basic instincts play a vital role in directing human behavior. These are known as Life Instinct & Death Instinct. While Life Instinct provides a positive urge to remain alive and the Death Instinct builds up a negative attitude towards life and guides one's behavior towards destruction, aggression & suicidal tendencies.
2. Mind or Psyche plays a significant role in directing one's behavior. According to Freud human mind may be divided into three compartments in the form of Conscious, Sub-conscious & Unconscious. The unconscious behavior being 9/10 part of the total behavior, always dominates the total behavioral aspects and personality make-up of an individual.
3. Freud put forward the idea that the anatomy of our personality is built around the three unified and interrelating systems- Id, Ego & Super Ego. The position of three systems are shown in the figure:

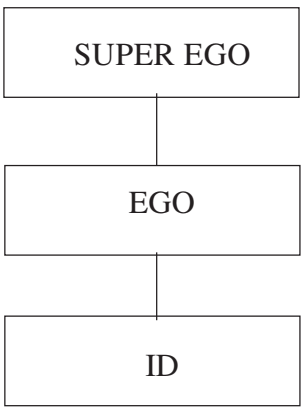

Fig.5 Division of human mind

Id is the immoral staff of a man's personality that is hidden in the deep layers of one's unconscious mind. It is guided by pleasure seeking principle. It has no values, knows no laws, follow no rules.

Id cannot be allowed to discharge its energy, thereby a second system, the Ego controls the satisfaction of unlawful activities of the Id. It is followed by reality principle, & decides what desires have to be satisfied and in which way they are to be satisfied.

The third system of personality is Super Ego. It is the ethical and moral part of personality. It is decision making body which decides what is good or bad.

The individuals who have a strong or powerful Ego are said to have a strong or balanced personality because Ego is capable of maintaining proper balance between Ego and Id.

In case, of an individual possesses a weak ego, he is bound to have a maladjusted personality. Freud tried to explain gradual development of personality through his concept of psycho-sexual development. A child passes through five stages in respect to his psycho-sexual development.

The oral stage- According to Freud, mouth represents the first sex organ for providing pleasure to the child. Therefore, a child is used to get pleasure by putting anything like candy, thumb, and stick to his mouth.

The anal stage- At this stage, the interest of the child shifts from mouth to the organ of elimination, i.e. anus and urethra. He derives pleasure by holding back or letting go off the body's waste material. This stage is ranging from two to three years.

The genital stage - This phase ranging from 4 to 6 years .At this stage, a child's interest shifts from the eliminating organs to the genitals. Children at this stage begin to notice the biological differences between the sexes. This type of awareness may give birth to a number of complexes. This stage is characterized by Oedipus & Electra complexes; it means a child's attraction to opposite sex parents.

The latency stage – This stage starts from six years in case of girls & eight years in case of boys and extends till the age of adolescence. At this stage, boys &girls prefers to be in the company of their own sex & even neglect/ hate members of opposite sex.

The phallic stage – The starting point of this stage is puberty. The adolescent boys & girls feel attraction towards opposite sex members. Their behavior is centered around the satisfaction of sexual needs. .

In this way, Freud adopted a different & unique approach for understanding the mechanism of personality. However, some of his views were not accepted by Alfred Adler & Carl Jung, who were known as Neo-Freudians.

Neo-Freudian theories

Carl Jung, a close associate of Freud, stressed the rational & spiritual qualities of man. He concluded that libido represents all the life forces, not just the sexual ones, and that arises in the normal courses of body metabolism just as physical energy does. Jung saw unconscious as the ego's source of strength and divided it into two parts: personal unconscious & collective unconscious. He believed that human mind contains thought forms called archetypes, made up of the collective memories of experience common to man till since pre-historic times. Jung proposed two types of personalities—the introverted & extroverted.

Karen Harney, a prominent neo-Freudian, opined that environmental factors (especially human relationship in which a child grows up) are the most important influence in shaping personality.

Eric Fromm who contributed to the psychoanalytic theory of personality believed that personality is determined by social needs. He proposed five human needs-relatedness, transcendence, rootedness, sense of identity & a frame of reference—which can be satisfied only by associating with other people in a society.

In contrast to Freud, Erik Erickson feels that personality continues to develop throughout the life span. He described eight stages of personality development—

1. Trust vs. Mistrust
2. Autonomy vs. shame
3. Initiative vs. Guilt
4. Industry vs. Inferiority
5. Identity vs. Confusion
6. Intimacy vs. Isolation
7. Generatively vs. Stagnation
8. Integrity vs. Despair

Trait theory

Some psychologists believe that a unique pattern of traits exists within each person and that these traits play a dominant role in the person's behavior. They define traits

as relatively permanent and consistent behavior patterns which an individual exhibits in many situations and which reveal his adjustment to his environment.

Allport has given the theory of personality development based on the inter-relationship of traits and uniqueness of the individual. Traits can be categorized as- Common, Cardinal, Central and Secondary. Common traits means those almost everyone possesses to some degree, an individual may show cardinal traits, those that are so strong that they are reflected in the person's actions. Central traits are most typical of an individual. Moreover, secondary traits are less prominent traits that an individual shows only under special circumstances.

Trait theory of Cattell

The most accepted and recent theory of personality was developed by Cattell.

He has defined trait as a structure of personality inferred from behavior in different situations and described four types of traits:

Common traits: the traits found widely distributed in general populations like honesty, aggression and cooperation.

Unique traits: traits unique to a person, such as emotional reaction, temperamental traits.

Surface traits: traits can be recognized by manifestation of behaviors, like curiosity, tactfulness.

Source traits: these are the underlying structures or sources that determine behavior such as dominance etc.

Cattle's theory identities some specific dimensions of personality, so that human behavior related to a particular situation can be predicted.

Significance of Cattell's theory:

1. Cattell made use of this 16 factors of basic dimensions in the measurement of personality by developing a personality inventory known as Cattell's sixteen personality factor inventory (16PF) consisting of multiple choice questions.
2. The trait theory of Cattell describes and predicts the behavior of individuals on the basis of their personality traits.
3. Cattell's theory has given importance to the role of both heredity and environment in the growth and development of personality.

These sixteen personality factors are bi-polar factors: 1. Reserved- Outgoing 2. Less intelligent-More intelligent 3. Affected by feeling - Emotionally stable 4. Submission

– Dominance 5. Serious – Happy-go-lucky 6. Expedient – Conscientious 7. Timid – Venturesome 8. Tough minded – Sensitive 9. Trusting – Suspicious 10. Practical – imagination 11. Forthright – Shrewd 12. Self Assured – Apprehensive 13. Conservative – Experimenting 14. Group dependent – Self sufficient 15. Uncontrolled – Controlled 16. Relaxed –Tense.

Type-cum-trait theory by Eysenck

H.G. Eysenck identified second order factors and grounded traits into definite personality type. According to Eysenck, there are 4 levels of behavior organization.

1. At the lowest level, these are specific responses. They grow out of particular responses to any single act,viz, blushing.
2. In the lower second level, there are habitual responses. They comprise similar responses of an individual to similar situation.
3. The next level comprises habitual acts. Behavior acts which have similarities are said to belong to one group and are called traits.
4. The forth level is the organization of these traits into a general type. A type is defined as a group of correlated traits. Traits like persistence, shyness, rigidity have been grouped into a type termed as Introversion.

Eysenck's theory has demonstrated that human behavior and personality can be well organized into a hierarchy with specific responses at the bottom and the definite personality type at the top.

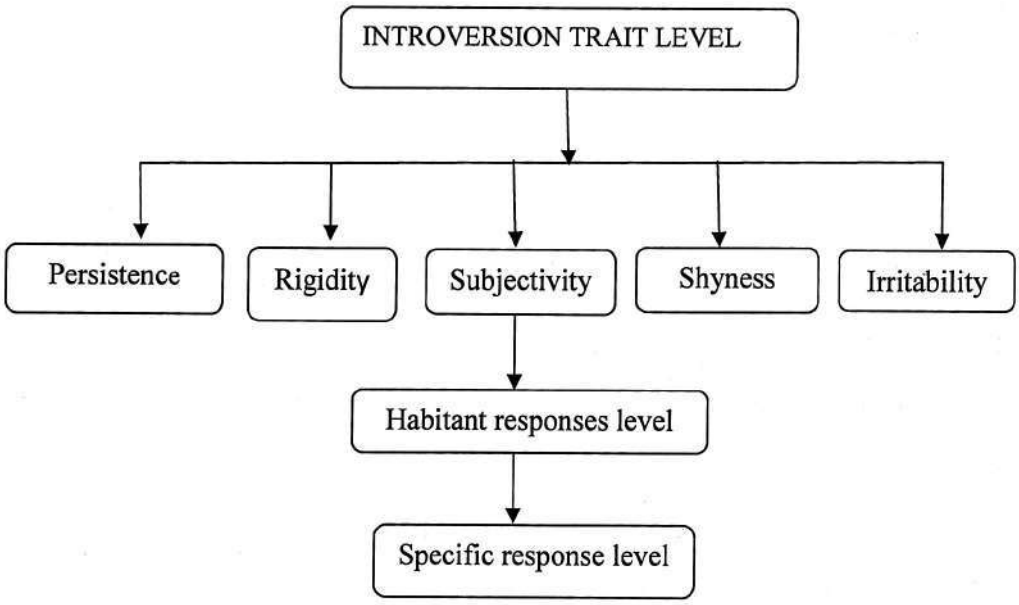

Fig. 6 Organization of individual behavior

The Humanistic Approach

Humanistic psychology, is known as third force of psychology (the other two being behaviorism and psychoanalysis) reflect a humanistic trend in dealing with human behavior. A number of theories subscribe to this approach. The view of Abraham Maslow will be discussed here.

The self-actualization theory of Abraham Maslow:

According to this theory, human being is basically good and neutral rather than evil and there is a craving towards growth or the fulfillments of one's potentials. The goal is to achieve self actualization. The behavior or personality of an individual being thus depends upon his style of striving towards the goal of self – realization. The goal is achieved through the satisfaction of lower order need.

Thus the pattern of human behavior is always governed by satisfaction of our needs from the lower, base level to the upper, top level. Thus we have to satisfy our biological needs for our survival, we have to strive for social-psychological context by satisfying social and psychological needs. The satisfaction of these needs is not the end of man's pursuits for excellence. His craving for self- actualization continues until he reaches his ultimate goal of attending humanistic values. Maslow concluded that the self - actualized people have the following characteristic which distinguish them the average person.

1. Ability to perceive reality accurately.
2. Willingness to accept reality.
3. Naturalness and spontaneity.
4. Ability to focus on problem rather than on themselves.
5. Need for privacy.
6. Self sufficiency and independence.
7. Capacity for fresh, spontaneous, non-stereotyped appreciation of objects, events and people that they encounter.
8. Ability to attend transcendence.
9. Identification of humankind and shared social bonds with other people.
10. They may have many/few friends, but shared social bond with other people.
11. A democratic, egalitarian attitude
12. Strongly held values.

13. A broad, tolerant sense of humor.
14. Inventiveness, creativity and ability to see things in a new way.
15. Resistance to confirm or succumb social pressure.
16. Ability to go beyond dichotomous and bring together opposites.

Thus the goal for personality development, according to Maslow's theory is self – actualization. That is realization of one's own potentials.

Assessment of personality

The method used for assessment of personality may be classified as:

1. Subjective methods. 2. Objectives methods. 3. Projective methods.

But it is difficult to draw a straight line between subjectively and objectively, even projective techniques are not free from subjectivity. Therefore, other ways to classify personality assessment techniques may be described as:

- Techniques where the individual's behavior is observed in actual life situation – a) observation techniques and b) situational test.
- Techniques where an individual says about himself – a) Questionnaire b) Personality inventory c) Interview
- There are techniques, where other people say about the individual whose personality is under assessment: a) Case history method b) Rating scale c) Socio-metric technique.
- There are techniques where we can see how people react to situation involving fantasy. These are projective techniques.

Observation- Observation is a method of studying behavior in actual life situation .It can be done in two ways. In one, the observer becomes more or less part of the group under observation .He does not hide his presence .In other situation, he takes a position from where he can observe the behavior in detail. For clear observation, he may use tape recorder, cameras, telescope etc.

To get reliable information, observation may be done by a number of observers.

Questionnaire – The word Questionnaire refers to a device for securing answer to questions by using a form which the respondent fills in himself (Goode and Halt, 1952). In order to collect information from the subject himself about his personality characteristics, a form consisting of a number of questions is used. The subject responds

to these questions by putting a ‘“’ mark in the columns of ‘Yes’, ‘No’ or cannot say(?). These answers are evaluated to assess personality.

Personality Inventory

Inventory and Questionnaire are similar in respect of administration, scoring and collecting all kinds of information, whereas inventory is designed to seek answers about the person and his personality. Some of the best known personality inventories are: Minnesota Multiphase Personality Inventory, (MMPI), Bernreuter Personality Inventory, Bell’s Adjustment Inventory etc.

Rating Scale- Rating scale is used to know from others where an individual stands in terms of certain personality traits. It reflects the impression the individual has made upon other who rates him. Some techniques of developing a rating scale are:

- The traits / characteristics which are to be evaluated are to be defined clearly.
- The appropriate person for rating,

There are 3 points, 5 points, 7 points rating scales, the degrees are indicated by numbers, 1 to 3, 1 to 5 , and 1to 7. The five points rating scale is of the following type:

5	4	3	2	1
Very good	Good	Average	Poor	Very Poor

But rating scale may suffer from some demerits like subjective bias and halo effects. The rater may have subjective likes or dislikes about a person. In halo effect, the rater may have tendency to rate an individual on the basis of general impression.

Interview - Interview is the process of getting information from face-to-face contact. For this purpose, a psychologist fixes a face to face appointment with the person to assess the personality traits and behavior. Usually, a list of questions is prepared and the psychologist tries to seek answers to these questions.

The interview may be structured and unstructured. In structured interview, the interviewer prepared a predetermined list of questions. In the unstructured interview, the interviewer is free to develop conversation that seems to be most suitable to him.

Projective technique – Projective technique enable a subject to project his internal feelings- attitudes, need, values or wishes to an external object. Projective test is a relatively unstructured yet standard situation to which a subject is asked to respond. This technique measure covert or unconscious behavior. Study of unconscious behavior is more significant than conscious behavior, which can reveals the inner world of the individual. The following are some of projective techniques.

The Rorschach Ink- Blot Test

This technique has been developed by Swiss Psychologist, Harmans Rorschach. Material of this test consists of 10 cards with ink-blots. Five of them are black and white and five are multicolored. The ink-blots are unstructured which do not have any specific meaning. The subject is shown each card in turn and is asked to tell and describe the blots without any hesitation .The subject is allowed as much time as he needs for a given card is permitted to give as many responses to it. After all cards are presented, the second phase of inquiry follows. Responses are score in term of location, determinant and content. The test demands a lot of training in scoring and interpretation.

Thematic Apperception Test (TAT)

It is a leading projective personality test. The test consisting of perception of a certain picture in a thematic manner. The test was developed by Murray and Morgan.

It consists of 30 pictures which portray human being in a variety of life situation. Ten of these cards are meant for males, 10 for female and 10 for both. The test is administered in two sessions. The pictures are vague and indefinite. There is no right or wrong answer. The individual has to make up a story for each of the picture within a fixed time.

For the interpretation of the TAT, it should be remembered that TAT pictures are best seen psychologically as a series of social situation and interpersonal relation. The interpretation is based on the 'Hero of story. Theme of story, style and content, particular emphasis or omission, attitude towards authorities and sex outcome.

The Children Apperception Test (CAT)

The CAT is version of TAT modified by Leopold Bellak and Sonya Soral Bellack for use with children between the ages of three and ten. It was designed to understand child's relationship to his most important figure and drives, the pictures elicit responses to feeling problems, sibling rivalry, attitude towards parental figures, to learn about the children's relationship to the parents. CAT consists of 10 pictures developing animals in various situations.

Sentence Completion Test

It is a very good projective technique of personality and reveals unconscious motives, hostilities and anxieties. Sentence completion is of many types. Generally, the beginning of the sentence is given and the subject is asked to complete it. Large number of person can be tested in one sitting. These responses are analyzed like TAT. The moods, purpose, solutions, aspiration are explained according to his personality.

4.7 Implications of teaching-learning with reference to children with disabilities

Defining Disability:

There is no single agreed upon definition of disability. These are efficient conceptual models of disability that suggest significant changes in the way disability is understood. These models can be expressed as 'medical ' vs 'social model'. The medical model views disability as a problem of the individual, requiring medical care. In other words it considers disability as an individual effect that needs to be correlated. This has led people to believe that person with disability are not capable, not educable and not fit to study in mainstream schools. This exclusion from mainstream schools and from society on the basis of disability is an example of inequality.

On the other hand, the social model of disability views disability as a socially created problem. For example, if the child with disability is having problem in gaining access to the school and participant in classroom, it is not because of the disability but because of the school system that has failed to fulfill its obligation to be accessible to children with disability. According to international classification of Functioning, Disability and Health (ICF,2001), disability under the social model is not an attribute of individual, but a complex collection of conditions, many of which are created by the social environment.

Hence, the management of the problem requires social action, environmental modifications necessary for the full participation of people with disability in all areas of social life.

The person with disability Act, 1995 considers disability as an individual pathology. According to the Act, 'disability' means –

1. Blindness
2. Low vision
3. Leprosy cured person
4. Hearing impairment
5. Loco motor disability
6. Mental retardation
7. Mental illness

Blindness refers to a condition where a person suffers from any of the following conditions,

A) Total absence of sight,

B) Central visual acuity of 6/60 of less in the better eye with corrective glasses,

C) Limitation of the field of vision subs tending an angle of 20 degree or worse.

Person with low vision

Means a person with impairment of the visual functioning even after treatment but who uses or is potentially capable of using vision for the execution of a task with appropriate assistive device.

Leprosy cured persons

Means any person who has been cured of leprosy but is suffering from:

A) Loss of sensation of hands of feet, as well as loss of sensation and paresis in the eye and eye-lid but with no manifest deformity.

B) Manifest deformity and paresis, but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity.

C) Extreme physical deformity as well as advance age which prevent him from undertaking any gainful occupation.

Hearing impairment means lost of 60 decibels or more in the better eyes in the conversational range of frequencies.

Loco motor disability

It is the disability of the bones and joints muscles leading to substantial restrictions of the movement of the limbs or any forms of cerebral palsy.

Mental illness

It means any mental disorder other than mental retardation.

Mental retardation

It is a condition of arrested or incomplete development of mind of a person which is specially characterized by sub normality of intelligence.

The children with disabilities deviate from the normal in physical, mental, social and emotional characteristics to such an extent that they require special social and educational services to develop their maximum capacity. They are often called as children with special needs.

The needs of the disabled/ exceptional children, essential for their survival, growth, development and adjustment to their self and environment may be described follows:

- Physical and physiological needs
- Socio-psychological needs.

The satisfaction of these needs is quite vital for the survival, adjustment, well-being and progress of the children. Through the satisfaction of these needs, they remain on the right track of their adjustment and development. But blockage on the path of the satisfaction of these needs, the children get maladjusted.

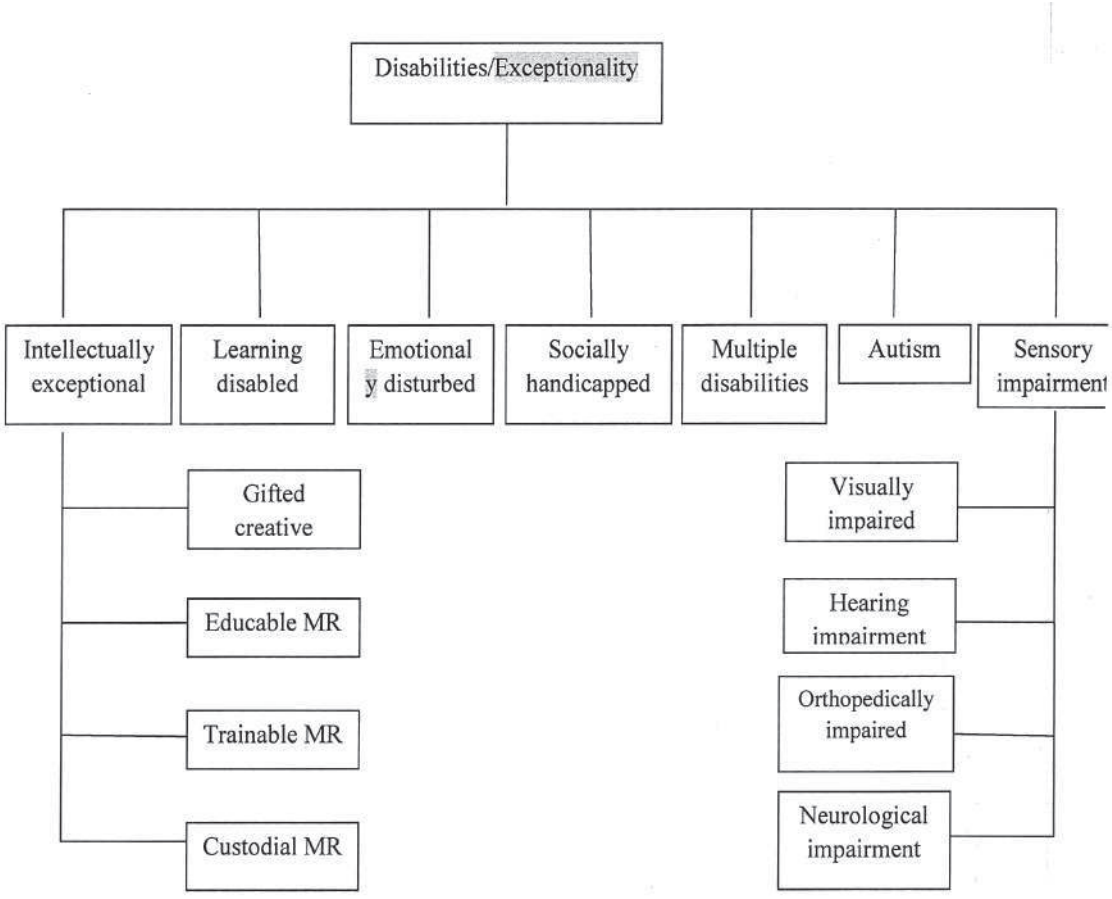

Fig.7 Type of disabilities and teaching learning process

Among these classified groups, teaching-learning process of educable groups will be discussed:

Intellectually exceptional:

1) Gifted children – they are defined in terms of IQ. Terman set 140 IQ as the lower limit of giftedness.

The educational services for the gifted children take place in one of these three forms:

- Acceleration
- Enrichment
- Grouping in special classes

Acceleration – Any instructional program that enables the student to progress more rapidly and complete a programme in less these or act an earlier age could be termed as 'Acceleration'

Enrichment – it is defined as the type of activity devoted to the further development of the particular intellectual skills and talents of the gifted child. It is the process of offering independent activities that demand thinking, originality, problem solving.

Grouping in special class – Grouping or 'ability grouping' is the process of segregating bright children in a class to provide opportunities for stimulation advancement. Here school programme should be individualized and flexible.

Mild mental retardation – Mentally retardation may be classified into there groups. The classification based on AAMD (American Association on Mental Retardation) system is shown below:

Categories of MR	IQ range
Mild mentally retarded	50-55 to approx 70
Moderate mentally retarded	35-40 to 50-55
Severe mentally retarded	20-25 to 35-40
Profound mentally retarded	Below 20 or 25

Fig.8 Classification of MR

Among these groups, only mild mentally retarded are educable. Hence the education programme of this group will be discussed:

Following points must be taken into consideration for planning educational programme of them –

- They are capable of reading and writing but they need over learning.
- Teachers must provide them the opportunity for enough repetition and drill.
- Teachers should select the tasks that are brief and easy enough to learn.
- Special emphasis should be given on understanding.
- Exercise should be broken down in small steps.
- Teacher should apply Hull's basic principles of learning, repetition, reward and trials.
- Correct responses should be immediately rewarded.
- Instruction should be systematic, sequential and repetitive.
- Concrete examples should be used.
- Supportive and corrective feedback should be provided.
- Moreover, training in socially adaptive behavior should be provided.
- They should be helped to develop some in protect traits to held jobs, such as punctually, to take advice, willingness to de work etc.

A curriculum for children's Effective peer and teacher skills (ACCEPTS) consists of sequenced self of activities with emphasis 5 skills –

1) Classroom skills (to follow directions)
2) Basic interaction skills
3) Getting along
4) Making friends
5) Coping skills

Teaching learning programmes for visually-impaired

A visually impaired child needs all that a sighted child needs, so they should be educated in the same way as sighted children. Some adaptation are required which involve the use of the remaining sight or to rely on other sensory experiences to acquire information. For partially sighted and blind children, modification are required in four major areas:

Use of remaining sight

a) Braille

b) Use of remaining sight

c) Listening skill

d) Orientation and mobility training.

The entire area of the additional skills for the visually impaired may be termed as 'Plus curriculum'. It means they require traditional academic content taught to the sighted children as well as disability specific content in order to be successful in the traditional curriculum.

a) Braille - can be used for reading and writing. Braille is a system in which raised dots are used to allow blind people to read with their fingertips. Braille can be written by hand using Braille slate and styles.

b) Use of remaining sight- There are children who are not totally blind that they require Braille. They are known as partially blind or children with residual or low vision. It is the fact that residual vision, in most of the cases can be used for providing optimum learning experiences to the child. Special types of materials and aids, such as large-print material, optical aids, magnifying devices can be used.

c) Daily living skills—These skills include eating, dressing, body hygiene; such as- cleanliness, bathing habit, washing cloth, handling money, shopping, using electrical appliances, telephone, food preparation, shaving, using medicine etc.

d) Listening skill - The visually impaired relies on listening as a means of getting information. To overcome communication problems caused by loss of sight, listening skills are developed. These are focusing on a single sound source, to analyze the oral information and focus on a key sound source. Recorded materials are generally used for them.

e) Mobility training –Mobility is the ability to get around in one's locality. According to Warren and Kocon (1974), there are two aspects of mobility -- mental and physical. The ability to form mental representation of the environment can be formed by the use of embossed maps and relief maps. These are not only important for learning geography but help to develop spatial perception and orientation of blind.

Physical mobility can be aided by using devices like __ Hoover Cane, The Path Sounder, Lesser cane etc.

Hearing impairment It refers to the impairment of processing linguistic information through hearing, with or without amplification, that adversely affects educational performance (Individuals with Disabilities Education Act, 1990).

Teaching – learning provisions for hearing impaired

Language and speech are two important avenues of communication. When a child born deaf, he grows up a 'mute' because he has never heard a word or sound for reproduction. As a result, he is unable to speak though there is no organic defect. In teaching- learning situation teachers often face problems to communicate with HI children. There are two approaches of teaching communication—

1. Oral approach
2. Manual approach.

Auditory training and speech training are associated with oral approach, sign language and Finger Spelling are manual approach.

Auditory training:

The aim of auditory training is to make use of residual hearing. A hearing impaired child needs to develop an awareness about a variety of sounds in his environment, including the speech sound. In order to develop awareness, parents should encourage children to use hearing aids as early as possible.

After the development of awareness, the next step is the process of teaching him to discriminate among environment sounds. When the child is able to discriminate among environmental sound, he is taught to discriminate among speech sounds. But auditory training must be geared to a child's auditory capabilities. Auditory training even without a hearing aid should be began as soon as it is determined that child is deaf.

Speech reading or lip reading

Speech reading is an important method of communication. It is often named as oral aural method. Children who have partial hearing, they need to rely on the lip movement of the speaker in order to understand what he is saying. In lip/speech reading, the child not only observe lip movement of the speaker but also uses visual stimuli in the environment to comprehend the spoken messages. The speaker should speak slowly

but clearly. Speaker's face should be clearly visible to the child. Speaker should not speak too loudly close to the hearing aid.

Manual techniques

Sign language – This method is used for severely hearing impaired in order to communicate. It is a system of gesture to convey thoughts and ideas. Today a standard set of sign language known as American Sign Language (Ameslan) is used by many deaf people.

Finger Spelling- Finger spelling is used by severely deaf people to communicate among themselves and with others. It is process of writing with finger in the air. Finger spelling is a kind of manual representation of written language and based on English alphabet. There are two types of Finger spelling. In American System, finger spelling is performed in one hand and in British System, both hands are used. The Indian manual System, 'Karapallabi' has been developed to use in Indian Context, and is based on American one hand System.

Total Communication System

It is a combine system which combines finger spelling, sign language, speech reading and auditory amplifications. Total communication requires the incorporation in order to ensure effective communication.

Regarding the training and education of HI, teachers should work concertedly with the child's family. In fact, a hearing impaired child can learn more meaningfully when his family is actively involved than when teaching is carried out by teacher alone. Moreover, Computer Assisted Instruction (CAI) is an important tool for educating HI children, generally micro Computer is used for teaching, reading, writing and sign language.

Learning Disabilities

The global concept of learning disability includes problems in listening, concentrating, spelling, thinking, memory, reading, writing, spelling, and/or social skills (Kamphaus, 2000).

Children with learning disabilities –

- Are of normal intelligence.
- Have normal difficulty in at least one academic area and usually several.
- Have no other diagnosed problem or disorder, such as mental retardation.

- The disability exhibits disorder in basic psychological processes.
- The disabilities occur due to dysfunction of central nervous system.

Kinds of Learning disabilities

1. Listening and oral expression disorders (Aphasia) - children with language disorders, have difficulty in one of the components of language- Phonology, Morphology, Syntax and Semantics.
2. Disorders of reading (Dyslexia) – this disorder are manifested by difficulty in learning to read despite adequate intelligence, socio-cultural opportunity. They fail to attain the language skills of reading, writing, spelling commensurate with their intellectual ability.
3. Disorder of written expression (Dysgraphia)- the inability to learn to write is known Agraphia. The mild form of Agraphia is Dysgraphia. Those who suffer from this impairment have extremely poor handwriting or are unable to perform the motor movements required for writing. Some errors may be observed in their handwriting:

   Handwriting is too much slanting.

   Writing too heavy

   Writing too light

   Writing too straight

   Writing too angular

   Writing too irregular

Disorders of spelling

Some of the spelling difficulties faced by learning disable are as follows (Bruckner and Bond, 1985):

1. ie and ei difficulties- Perceive, Deceive
2. y for iwhen suffix is added- Mercy, Merciless
3. y for I in plurals- Cry (cries)
4. os and oes- Potato (potatoes)
5. effect of final e- Rat (rate)

6. doubling final consonant- (Run) running

7. u follows q- Quarrel, quick

Mathematical Disabilities (Dyscalculia)

This problem is found in large number of students. The disabilities in other areas affect mathematical abilities. The children who have difficulties to read words often experience problems to solve word problems, children who invert and reverse words or numbers, have difficulty to work with numbers.

Some instructional approaches

Real life problems and application should be used to make meaningful, as students learn more easily when they see the relationship of assignment with real life problems.

Concept of math should be developed through concrete experiences.

Math should be taught through activities that make math fun to increase interest and to remove fear.

Teacher should give some basic problem-solving concepts.

Educational considerations

According to professionals following approaches may be adopted in planning educational programme for learning disabled:

- Process training
- Structure of stimulus reduction
- Multisensory approaches

Process training-

In planning educational programme for learning disabled, one needs to consider the underlying psychological processes are associated in learning academic subjects. Children should be given training in the psychological process to overcome the difficulties. For example, if a student has difficulty in using language either written/ spoken due to the difficulties in visual perception, he should be given some visual perception training.

Multisensory approaches

This approach emphasizes on using multi-sensory system to correct child's problems. It is expected that if the child learns by using more than one sense, learning will be

more effective. Fernald's VAKT method (V for Visual, A for Auditing, K for Kinesthetic and T for Tactual) may be applicable as multisensory approach.

Structure and stimulus reduction

Some structural programmes with least extraneous stimulus can be effective for hyperactive and inattentive learning disabled children. Cruickshenk (1961) recommended that in a structural programme, activities should be determined by the teachers, so that the hyperactive learning disabled children cannot make his own decision.

In stimulus reduction, some irrelevant stimuli are removed that may distract child's attention.

Other approaches and techniques

Discrimination learning- The LD children face some problems of discriminating one letter from another, one word from other word, one number from another. They should be trained to observe the similarities and difficulties between letters, numbers and words. For this purpose, materials should be presented both visually and auditorily to heighten their attention.

Visual memory training – the training may be given by having the children to close their eyes and to describe some learning materials.

Spatial training- it can be provided by having children to identify top, down, sides, and bottom of some objects. They should be trained to understand concepts like bigger, heavier, near, for etc.

Computer assisted instruction- As LD children have some basic skill deficiencies, computers are being used to provide remediation in these areas, computer provide repeated learning or practice to assist children in the acquisition of basic skills.

4.8 Let Us Sum up:

Motivation plays a significant role in the teaching-learning process as motivation is a process that engages an individual and affects learning and performance. Different theories of motivation help us to understand how an individual is motivated through the satisfaction if basic needs. In this context, Maslow's Need Hierarchy theory, Mc Clelland's Achievement Need theory and Attribution theory of motivation are discussed.

Learning is a process through which experience cause permanent change in one's behavior. There are Traditional theories of learning which emphasize of the change

of behavior through of bond between stimulus and response.Whereas cognitive theories emphasize on the change of knowledge. Theories, Classical Conditioning theory and operant Conditioning are discussed as Behavior Theories of learning. On the other hand, social cognitive learning theory, cognitive information processing theory and cognitive Constructivism theories are discussed as cognitive theories.

Personality is the some of innate biological and acquired disposition. Perspectives of personality development and different personality theories, namely, Trait theory, Psychoanalytic theories of Freud, Neo-Freudian theory are discussed in this unit. Moreover, different methods used in personality assessment are also discussed.

Type of disabilities and their effective teaching-learning processes are discussed in the last part of this unit.

4.9 Unit End Exercises

A) Please read the following statements carefully and state whether the statements are True (T) or False (F)

I. Need for security is a belongingness need.

II. Attribution theory was developed by Meclelland.

III. Students who have little faith in their ability, attribute their success to luck.

IV. The desire to make friendly relationship is related to affiliation need.

V. Cognitive Psychologists believe in observable behavior.

VI. Piaget is a cognitive Psychologist.

VII. Operant conditioning theory was developed by Pavlov.

VIII. According to behaviorists re-inforcement strengthens behavior.

IX. Attention plays an important role in social cognitive learning.

X. The information in the sensory memory is retained for long time.

XI. Short term memory is called working memory.

XII. One of the causes of memory loss is displacement.

XIII. Semantic memory is related to time and space.

XIV. Knowledge is constructed to resolve cognitive conflict.

XV. Vygotsky believed in individual constructivism.

XVI. Only gene play an important role in personality development.

XVII. Ego is guided by pleasure seeking principle.

XVIII. Latency stage is characterized by Oedipus complex.

XIX. According to Erickson, personality development takes place through eight stages.

XX. The trait theory was developed by Allport.

XXI. Sentence completion is a projective test.

XXII. Dyslexia means disability in writing.

XXIII. Orientation and mobility training is given to deaf.

B. Fill in the blanks

I. Personality is a _____ organization.

II. Id lies in _____

III. When child get pleasure through simulation of mouth is called _____ stage.

IV. One of Neo-Freudian theorists is _____.

V. _____ discovered 16 factors of personality.

VI. _____ is a projective technique.

VII. Attribution theory of motivation was developed by _____.

VIII. Two stimuli are used in _____ conditioning.

IX. _____ Cognitive processes are included in social cognitive approaches to learning.

X. Knowledge construction is based on _____ knowledge.

XI. The term 'scaffolding' was used by _____.

XII. Enrichment is the educational service provided to the _____.

XIII. For learning impaired children, finger spelling is a _____ approach.

XIV. Dyscalculia means _____ disabilities.

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Unit - 5 □ Psychological Aspects of Teaching

Structure

5.1 Inroduction

'Teaching is an art derived from the science of psychology' says Williams James. Teaching is rather a challenging, complex and rewarding profession. A thorough acquisition of pedagogical skills and alertness to individual learning requirements make one a gifted teacher. Effective instruction is the major contributor of learning and consequently if learning is not satisfactory, it means that instructor is surely ineffective.

5.2 Objectives

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

- Know about individual differences
- Understand gain an understanding of teacher effectiveness
- Know & delineate Various kinds of tutoring and learning
- About disability and its guidelines

5.3 Individual Differences In Cognitive and Affective Areas and its Educational Implications

Individual differences are the more-or-less enduring psychological characteristics that distinguish one person from another and thus help to define each person's individuality. Among the most important kinds of individual differences are intelligence, personality traits, and values. The study of individual differences is called differential or trait psychology and is more commonly the concern of personality psychologists than social psychologists. Individual differences are neither a fiction nor a nuisance; they are enduring psychological features that contribute to the shaping of behavior and to each individual's sense of self. Both social and applied psychology can benefit by taking these enduring dispositions into account.

How individuals differ in traits such as skills, aptitudes, and abilities to learn and perform. Learners may vary in their personalities, motivations, and attributions for their successes and failures when learning—all of which may affect how and why they learn. Additionally, they differ in their preferences for learning and their willingness to learn. Some traits may be more adaptive, whereas others are stable and less malleable, or resistant to change, especially as an individual matures to adulthood. Examples of stable traits are gender, culture, and race. Even education and age are considered as stable traits. Traits that may be more malleable, or adaptive, could include effort and attributions of success and failure, among others. Individual differences may be considered in making the learning environment educationally appropriate, interesting, and relevant.

Abilities are cognitive or mental characteristics that affect one's potential to learn or to perform. Aptitudes are sometimes treated as interchangeable with abilities, particularly when they focus on prediction of performance in other settings or on other occasions. Cognitive abilities have been conceived very broadly (e.g., intelligence) and also in terms of specialized abilities such as verbal, spatial, memory, reasoning, problem solving, and psychomotor ability. Some authors have defined aptitudes more broadly than abilities, to include any number of individual-differences factors—affective, cognitive, and personality characteristics—that influence one's readiness or likelihood of learning or performing successfully.

NATURE OF INDIVIDUAL DIFFRENCES

When individuals in general are studied, it is found that instead of two opposed types, there is a continuous gradation from one extreme to the other, with a concentration

of individuals about a central point and the frequency of occurrence decreasing as the deviation from the mean increases. Individual differences are matters of degree and they are distributed along a continuum. If we consider the intelligence of a very large group of ten- or eleven- year old children, we shall find that the majorities have an IQ between 90 and 110, a few children will have their IQs between 110 and 120 on one and an equal number will have their IQs between 80 and 90 on the other side. A fewer number will have IQ between 120 and 140 on one side and equal number will have their IQ between 60 and 80 on the other side.

An interesting fact is that variations are not only found between individuals but even within the same individual. True, one's abilities tend to approximate to a common level of achievement, but the correlation is not always perfect. Though Raju and Sunil differ in physical strength, IQ scores, school achievements, interests and aptitudes, differences are found even within themselves. All of Sunil's abilities are not developed uniformly; thus his academic achievements are not equaled by achievements on the sports field. Even in academic achievements, Sunil scores high marks in mathematics, but always has difficulty in getting even the minimum marks required for passing in the languages. He loves biology but he finds history boring.

Raju scores 30 in English, 41in Hindi, 35 in Kannada, 50 in science and 59 in mathematics. He classified as an average student. Yet, see the marked difference between his linguistic ability and mathematical ability. Such differences within the individual are called *intra-individual differences.*

TYPES OR VARIETIES OF INDIVIDUAL DIFFERNCES

Differences between different individuals are noticed in various areas, which influence school achievement. Some of the areas are intelligence, personality, interest, attention-span, age, attitudes, values, cognitive development, learning style, learning strategies, motivation, perception, previous knowledge, problem solving ability, creativity, self-concept, self-esteem, social competence, speed of various psychomotor skills, etc. The following three domains come under the individual differences. They are as follows:

1. Cognitive
2. Affective
3. Psychomotor

COGNITIVE DOMAIN:

Differences in this domain mainly refer to intelligence, aptitude, learning style and cognitive style.

INTELLECTUAL DIFFERENCES

Differences in intelligence can be measured by various intelligence tests. Intellectual ability is native and hence cannot be developed beyond a certain limit. It is really a challenging job for the teacher to deal with individuals having different intellectual levels. There are gifted and talented children who possess higher level of various abilities and talents. These children have significantly higher level of performance in areas like intellectual, creative and artistic activities.

There are intellectual disabilities on the other side of the scale. It refers to the individuals with an IQ score less than 70. Such children lack confidence, self-esteem and they mostly learn at the level of concrete operations. These children differ in the degree of disability, hence they need further classification.

APTITUDE

Aptitude implies a potential for learning in a particular area. Aptitude means an individual's capacity to learn and attain a particular level of achievement in a specific field. Intelligence on the other hand is one's potential ability to learn, whereas aptitude refers to the potential for acquiring skill in a particular area. We have some children who are fond of sports; some have inclination for the study of languages while some others have an aptitude for music.

It is the teacher's responsibility to identify the children with special aptitudes and provide opportunities for their development.

LEARNING STYLE:

It refers to the way of learning, the sped of learning, the type of learning and effectiveness of learning. Accordingly, we find children learning the material in different ways. Some learn by oral repetition, some may learn oral repetition, some may learn by writing it out, while others may learn through practical work. Individuals thus differ in the way they learn.

As far as speed is concerned, there are slow learners and fast learners. There exists a lot of difference both in the general and specific abilities of the slow and the fast learners. Classroom teachers have to face this challenge between these two groups in class room situation. Curriculum adjustment and grouping for instruction are the major problems.

COGNITIVE STYLE

Cognitive style depends upon the cognitive characteristics, which change according to the change in the age level. Children from 3 to 6 years of age are talkative. Their skill in the use of language can be developed through interaction, interests, admiration and affection. Children from 6 to 9 years of age are very eager to learn with built in motivation. These differences in cognitive style are not so evident in lower grades but they are sharp as children advance in age. Individuals are found to differ in the way they react to learning situations. Their performance is better in some learning activities.

AFFECTIVE DOMAIN

This area includes the differences in interests, attitudes, values, self-concept and achievement motivation.

INTERSTS

We come across differences in the achievement of students having nearly the same intelligence level. Some children show progress in drawing, some in music, while some in others. One of the reasons is the difference in their interests.

Interests can be learned and developed through environmental facilities and opportunities. To take note of the inclination of pupils, to guide them and to make provision for further development is really a challenging task for any teacher. Knowing about the interests of the pupils can be helpful in educational and vocational guidance.

ATTITUDES

Differences in attitudes are dependent upon various factors like environment, family atmosphere, school atmosphere and relationship of the individual with peer groups. Individuals differ in their attitudes as they are brought up in that particular way. Attitudes are mostly developed at home and in the school.

Hence, it is the responsibility of teachers to develop proper and positive attitudes in their pupils. Teachers should try to provide proper atmosphere in the classroom.

VALUES

We see differences in the value system as practiced by various individuals. Values depend upon the attitudes and hence they can also be developed. Atmosphere surrounding the children should be congenial for the development of such values as love for others, punctuality, truthfulness, honesty, sincerity, cleanliness, regularly, neatness, tolerance and respect for the rights of others.

Differences in these values are visible at every level of the society. Lifestyle of an individual is determined by the values he cherishes. This in turn influences the lifestyle of the community.

SELF-CONCEPT

We find some individuals having a clear self-concept. They know their strengths and weakness. They are frank and confident in their day-to-day approach to various situations. But there are others who do not have the self-concept. They get disturbed easily; they are under tension, fear and stress. Such persons are usually maladjusted.

ACHIEVEMENT MOTIVATION

Every individual feels that he should achieve something in life and that he should get success in his work. This need for achievement is seen in varying degrees in individuals. Some are highly motivated by this need while others may not be so motivated. The development of achievement motivation depends upon various factors in the environment such as home, the child's parents and their expectations, guidance and encouragement given by the elders at home and at school.

The two important factors 'success and failure' which have a great impact on pupil's self-concept, influence his achievement. Failure demoralizes the child and leads to lowered or negative self-concept whereas success develops self confidence, initiative and creativity. Every school is, therefore, expected to provide opportunities for children to get success at least in some activities.

EDUCATIONAL IMPLICATIONS

The notion that individuals differ in various abilities, capacities and personality characteristics recessitates the adoption of individual tendencies in education. It compels the teachers to realize the following facts:

1. In any group there are individuals who deviate from the norms of the group. Along with the average, the presence of very superior and extremely dull is equally possible in his class.
2. Every teacher should try to have the desired knowledge of the abilities, capacities, interests, attitudes, aptitudes and other personality traits of his pupils and in the light of this knowledge should render individual guidance to children for the maximum utilization of their potentialities.
3. It is wrong to expect uniformity in gaining proficiency or success in a particular field from a group of students. On account of their subnormal intelligence, previous

background, lack of proper interests, aptitude and attitude some students have to lag behind in some or other area of achievement.

4. All students cannot benefit by one particular method of instruction and a uniform and rigid curriculum.

PROVISOINS FOR 'INDIVIDUAL DIFFRENCES' IN SCHOOLS

Realization of the above facts or some more of their nature makes us think that we must have some provision for the wide individual differences among our pupils in our schools.

How can we accomplish this task is a prominent question to be asked at this stage. In fact, to provide adequate schooling or learning experience for every learner according to his individuality is not a simple task. However, the following suggestion can be helpful for any teacher:

1. Proper knowledge of the individual differences.
2. Ability grouping
3. Adjusting the curriculum
4. Adjusting the methods of teaching
5. Adopting special programmes or methods for individualizing instruction.

5.4 Classroom Climate, Group Dynamic

What Is A Classroom Climate?

As well as instructors, students are not only intellectual but also social and emotional beings. Likewise, the classroom is not a static intellectual space but rather a multi-dimensional and 3 dynamic space. Ambrose and colleagues (2010) define classroom climate as "the intellectual, social, emotional, and physical environments in which our students learn". Different aspects of the classroom climate and student development – intellectual development and social identity development in particular – interact with each other to have an impact on student learning and performance.

These elements of the classroom environment are not mutually exclusive but rather interactive with one another, but instructors may attend to the following aspects of student development and classroom climate to consider how each aspect is related to teaching and learning:

STUDENT DEVELOPMENT

- **Intellectual development –** Depending on where students are at in their intellectual development, they could react to course content or a class discussion differently to shape a particular climate in the classroom.
- **Social identity development –** For college-level students, social identity – identification with certain social groups – is one of the most salient areas of development, and different ways in which each student sees him/herself can create a unique classroom dynamic.

CLASSROOM CLIMATE

- **Physical –** Physical aspect of the classroom and course delivery, such as classroom type (e.g., an auditorium, a small classroom, a lab), layout (e.g., students sit facing the front of the room, students sit in small groups, everyone sits in a circle), and medium (e.g., face-to-face, online).
- **Intellectual –** Intellectual aspect of the course and class, such as the course content, class discussion topics, course materials (e.g., textbooks, videos screened in class), and the forms and levels of skills and knowledge that students are expected to demonstrate.
- **Social –** The social aspect of classroom climate refers to relationships between students (e.g., individualistic vs. team-oriented, or competitive vs. cooperative) and between students and instructor (e.g., the instructor being approachable or authoritative to students) and the social atmosphere of the class (e.g., casual, formal, democratic, inclusive).
- **Emotional –** The classroom contains various emotions, and the emotions can shift quickly. Students and instructor can have different emotional reactions to course materials and class discussions. These emotions can widely range from discomfort to comfort, from anger to joy, from fear to empowerment, from confusion to excitement, and everything in-between and beyond.

The physical aspect of classroom climate is an important area of consideration. The physical aspect includes classroom type (e.g., an auditorium, a small classroom, a lab), layout (e.g., students sit facing the front of the room, students sit in small groups, everyone sits in a circle), and medium (e.g., face-to-face, online).

Among these physical dimensions of the classroom, classroom climate in an online space deserves special attention as online interactions are increasingly integrated

into our teaching and learning practice. Some studies report that an online classroom environment, in which student identities are anonymized, helps their class participation because an environment as such frees them from anxiety of others' eyes of judgment – including fear of being stereotyped or prejudiced based on their appearance or social identities, or being judged of their opinions or mistakes (Miyazoe & Anderson, 2011; Sullivan, 2002). On the one hand, anonymity could indeed help to reduce students' unproductive performance anxiety and self-consciousness and allow them to push their boundaries and freely explore new ideas or practice newly learned skills. On the other hand, it is equally possible that, because of this anonymity and sense of security behind computer screens, some students could feel freer to express their views that may be offensive or harmful to others, and other students are likely to remain bystanders (Straumsheim, 2014, 2015).

WHAT CAN INSTRUCTORS DO TO IMPROVE CLASSROOM CLIMATE?

Instructors may not be able to fully predict or control factors that are brought into the classroom or what actually happens there, but they have a great deal of control over, and responsibility for, the classroom environment they create. To create a respectful and productive classroom climate, you may explore strategies suggested by Ambrose and colleagues (2010), which include:

- Resisting a single right answer/Embracing ambiguity
- Encouraging learners to base their opinions on evidence
- Examining your assumptions about learners (e.g., unconscious bias of students' abilities)
- Not asking individuals to speak for an entire group
- Modeling inclusivity (e.g., Using inclusive language and diverse examples, integrating different perspectives into course content)
- Establishing and reinforcing ground rules for interactions (i.e., the instructor and/or the students identify a set of expected classroom behaviors, especially in discussions)
- Preparing learners for sensitive topics by explaining why it is valuable to discuss the topics despite potential discomfort and tension
- Addressing tensions early as they emerge and turning them into learning moments (e.g., Unpacking a learner's insensitive comment by explaining its possible impact

on some others despite a lack of a malicious intent, taking a time out when a heated moment arises to allow learners to write their reflections)

Why is Classroom Climate Important?

The teaching-learning process is an inherently social act, and as instructors we need to be mindful of the quality of the social and emotional dynamics in our course, because they impact learning and performance. In fact, a well-established body of research has documented the effects of a "chilly classroom climate" on some students or groups of students, in particular women and other minorities (Hall, 1982)

Climate regulates the circulation and construction of knowledge. For instance, in an inclusive climate all students are more likely to volunteer different perspectives and thus enrich discussions; conversely, if some students or groups feel that their contributions are not as valued as those of others, they will withdraw from the conversation.

Climate engenders emotions that impact learning. In a productive class, the learning experience is characterized by excitement for discovery, joy, satisfaction and pride at one's accomplishments. All these positive emotions have the effect of motivating students for further learning. Conversely, if the predominant emotions in a class are fear, shame or embarrassment for being wrong, or boredom and apathy about the content, these negative emotions will be highly demotivating to students (Ford, 1992).

Climate impacts student persistence. When the cumulative direct and indirect messages students perceive communicate that they are not as able as other students and don't belong in the course, students are less likely to stay in the course, the major, and even in the university (Tinto, 1993).

The classroom climate is a reflection of students' opinions of their academic experience (Reid & Radhakrishnan, 2003). This includes students' perceptions of the rigor of the class, their interactions with their instructor and class peers, and their involvement in the class. Although each student will develop his or her individual sense of the classroom environment, there is also a community, or collective, sense among the students and the instructor, so the classroom climate is a general feeling shared by all in the class (Fraser & Treagust, 1986). Students' perceptions often define the classroom climate because their exposure to multiple learning environments and their many opportunities to form impressions give them a credible vantage point from which to make judgments (Fraser & Treagust, 1986). Some of the dimensions of the classroom climate are as follows:

- Personalization: The instructor provides opportunities for student-to-teacher interaction and expresses concern for students' welfare.
- Involvement: The instructor encourages active student participation in class.
- Student cohesiveness: Students know one another, help one another, and are friendly toward one another.
- Satisfaction: Students enjoy class.
- Task orientation: Class activities are clear and well organized.
- Innovation: The instructor utilizes unique teaching methods, activities, or assignments.
- Individualization. Students are permitted to make decisions and treated differentially based upon ability and interests.

FOCUSING ON THE INTERPERSONAL ASPECTS OF TEACHING

Rapport is a feeling between two people encompassing a mutual, trusting, and pro social bond, and students have reported that rapport with pupils is a fundamental characteristic of any successful instructor. Instructors can utilize several confirming behaviors to convey care and develop rapport (Ellis, 2000, 2004). First, instructors respond to questions, which verbally and nonverbally communicate interest in students' comments. Teaching is a rapport-intensive field (Jorgenson, 1992) where both instructor and students enter the classroom with relational goals (Frymier, 2007). Rapport is built and a positive classroom climate is developed when instructors and students co-construct a learning environment that encourages active student participation (Sidelinger & Booth-Butterfield, 2010). The development of rapport and a positive classroom climate has been linked to positive student outcomes, such as promoting student motivation and diminishing student apprehension (Ellis, 2004).

Instructors can also adjust their teaching style as needed to help students understand material, which includes using a variety of instructional techniques, periodically confirming students' understanding of the material, and providing feedback on students' work. By employing the appropriate teaching style, instructors can communicate their interest in and desire to share that material with the students. In addition, when instructors ask students if they understand the material, they communicate that they care about the students' academic performance. Instructors can engage in many teaching practices to help develop rapport with their students and demonstrate warmth and openness reinforce student participation, and show clear organization. For example, the use of humor can aid in building rapport with students, possibly because it makes professors

seem more approachable. Humor can include funny stories and comments, appropriate jokes, or professional humor, such as mnemonic devices, cartoons to illustrate course content, puns or riddles, top 10 lists, and comic verses. Students can also use humor, such as sharing their experience about a comical moment in a classroom (Berk, 1996). Interestingly, instructor use of self-deprecating humor is positively associated with learning, possibly because it may be unexpected and therefore gains students' attention (Wanzer, et al., 2010).

Another way for instructors to develop rapport and communicate interest and concern to students is by talking openly about themselves in class, using appropriate self disclosure (Hosek & Thompson, 2009), which increases students' perception of a comfortable classroom climate (Mazer, Murphy, & Simonds, 2007).

FOCUSING ON CREATING A CONNECTED CLASSROOM

A connected classroom climate is perceived by students as a compassionate and supportive student-to-student environment (Dwyer et al., 2004). Student-to-student connectedness is built on a collection of behaviors—including praise, smiling, or sharing personal stories or experiences— that have positive effects on educational processes and outcomes (Sidelinger, Bolen, Frisby, & McMullen, 2012). Teaching and learning do not occur only between the instructor and students, but also among students themselves (Hirschy & Wilson, 2002), and instructors are critical in modeling positive interactions and demonstrating supportive behaviors in the classroom. Instructors who create connected environments may help motivate students to learn and discourage cheating (Bouville, 2010). A connected classroom climate is linked to students' increased preparedness for class (Sidelinger & Booth-Butterfield, 2010) and participation in class (Frisby & Martin, 2010). Students have recognized the importance that supportive peers play in creating a participatory environment.

IMPLICATIONS

Instructors and administrators realize that several factors influence academic outcomes. One such factor is instructor interpersonal characteristics, which play a vital role in student motivation, cognitive and affective learning, and overall academic performance. This corpus of research suggests that students believe their learning is greatly enhanced through personal interaction with their instructors and with other students. Ultimately, students want instructors who are respectful, supportive, available, and display enthusiasm for teaching. This objective could help guide faculty development efforts as well as individual instructors' efforts, which usually place more emphasis on the

instructional aspects of teaching, and less on the interpersonal aspects of the classroom. Instead, a learner-centered manner of instruction would be adopted, whereby the instructor focuses on the students' perspectives, experiences, interests, capacities, and needs (McCombs, 1997); establishes positive instructor student relationships; fosters student self-efficacy, and strikes a balance between being challenging and being caring (Pratt, 2002). This contrasts with a teacher-centered manner of instruction, which focuses on teaching and assessing learning objectives solely through course content and delivery. Although not all instructors feel comfortable engaging in every type of interpersonal interaction with students, they should be made aware of the importance of such interactions. For example, some instructors might feel more comfortable interacting with students in a typical classroom environment or during office hours, whereas others might use tools such as social media to communicate with students outside the classroom. Another aspect of faculty development could focus on encouraging instructors and students to discuss their expectations of the classroom environment at the beginning of a course. (Fraser & Treagust, 1986). Instructors can benefit from assessing their students' views of the classroom environment as well as their own, using one of several measurement instruments readily available (e.g., Fraser & Treagust, 1986; Winston et al., 1994; Wilkie, 2000). The assessments might expose disparities between students' and instructors' perceptions of the classroom climate. Such feedback could help instructors engage students in discussions about the classroom social systems, individual and collective behavior, and instructors' and students' expectations for interaction inside and outside the classroom. Exposing and discussing the differences in perceptions of the classroom environment could lead to greater course satisfaction for both students and instructors and improve instruction through greater respect and responsiveness.

GROUP DYNAMICS

Interest in group behaviour is quite a new area of research studies. Dynamics means changing. Imagine a group which is constantly interacting. The personality and behaviour of the members constituting the group undergo perpetual changes. The behaviour is not static. Group dynamics means the change of behaviour through interaction in the group. It refers to the forces which operate in group situations. It studies the structure of the group and other phenomena which emerge out of group interaction.

Examine the work of a teacher. He has to deal with groups from five to six periods daily. In order to make his teaching effective, he must study group dynamics of small groups. Class is collection of pupils coming from different socio economic backgrounds. The teacher must have knowledge of the process of interaction among students. If

the teacher is well- equipped with the basic knowledge of group dynamics, he can provide better guidance for adjustment. He would be able to improve the emotional and social climate of the class.

The knowledge of group dynamics has acquired tremendous importance in recent years in developing countries. Ours is a developing country the old joint family system is dying out. The family is not able to provide sense of security, cooperation and affection in the present era of disintegration of old joint family system. Adolescent boys and girls seek shelter, love, recreation and motivation from their groups. The teacher must know how adolescents form groups and what the structure of groups is in general and other mechanisms operating in group situation.

In school, most learning takes place in social situation. Mental health of the group is an important factor in the learning process. If there are conflicts, rivalry, fear or anxiety in the group, learning will be disturbed. Teacher with the knowledge of group dynamics can improve the social and emotional climate of the group. He can find out the causes and can use remedial measures to maintain conducive environment in the class. He can improve intra-group relations to maintain the mental health of the individual members.

5.5 Peer Tutoring, Co-operative, Self Regulated Laerning

What Is Peer Tutoring?

Peer tutoring is the process between two or more students in a group where one of the students acts as a tutor for the other group-mate(s). Peer tutoring can be applied among students of the same age or students belonging to different age groups. Encouragement of peer tutoring is a useful strategy that can be applied effectively by teachers in many cases in both monograde and multigrade schools.

WHY CHOOSE PEER TUTORING?

- It is a widely-researched practice across ages, grade levels, and subject areas
- The intervention allows students to receive one-to-one assistance
- Students have increased opportunities to respond in smaller groups
- It promotes academic and social development for both the tutor and tutee
- Student engagement and time on task increases

- Peer tutoring increases self-confidence and self-efficacy The strategy is supported by a strong research base

ADVANTAGES OF PEER TUTORING

The main reasons why peer tutoring is an advantageous teaching strategy are given below.

(a) Children understand easily tutors who are children, since they are cognitively closer to each other. Usually children find their own ways of communicating with other children and many times they can present a subject to other children better than an adult. Children-tutors can give to their class-mates their own models of understanding a subject, using their personal experience, fresh ideas, examples from children's every-day life, even popular communicating symbols that make learning easier.

(b) Peer tutoring not only ensures a good level of effective and efficient communication and cooperation in favour of the tutees but also acts at the benefit of student-tutors as well. The tutors' gains are the following:

- By spending time in revising the subject maters they have to teach to other students, they result in acquiring deeper and clearer knowledge on the specific subjects they deal with. It is said that we learn 95% of what we teach;
- Through tutoring, children tutors develop their ability and skill to teach and guide other students;
- Children tutors enjoy a rise in their self-esteem, feeling that they do something useful and seeing their tutees to improve. They also enjoy respect from tutees. Many times the ambition of older children to be selected as tutors increases competitiveness and results in improving the older groups' standards. Of course care should be taken from the teacher's side to limit as much as possible discrimination in favour of some children-tutors.

Structured peer tutoring improves communication and cooperation among students, enhances the team spirit and helps socialization.

PEER TUTORING IN A MULTIGRADE CLASS

Although there is no research evidence for peer tutoring in a multigrade classroom, it is expected that the effectiveness of this strategy is higher in such classes. More specifically it is well-known that in a monograde class the teacher has to manage teaching time in such a way as to succeed in a rational sharing among different groups.

This implies that for significant time intervals, during which the teacher teaches one group, he/she is not available for all the other groups, the exact time of the interval depending on the number of groups that belong to the same monograde class. Allowing young tutors in multigrade classes to play teaching roles, offers support in managing teaching time.

For an effective peer tutoring in a multigrade class it is essential to adopt the structured type of tutoring. The fact that tutoring of one or more groups takes place while the teacher is occupied with another group, makes necessary for the class to be well organised in this respect. Moreover, a good structure could be a way to overcome possible lack of experience in combining tutor/tutees.

In respect of structured peer tutoring in a multigrade school, there are several dimensions that should be taken into account, since putting some students together and assigning tutoring roles to individuals doesn't mean that positive outcomes are ensured. The young tutors, being students themselves are untrained on handling tutoring situations or are not really aware in depth on the subject they are about to tutor. They need guidance and support by teachers on developing tutorial, communicational and cooperative skills. For a successful structured peer tutoring in a multigrade class there are certain rules that should be followed:

1. It is required that teachers are familiarized with grouping techniques and have already implemented a mixed ability – mixed age grouping in their classroom.
2. It is necessary for the teacher to encourage peer tutoring, preparing tutors as well as tutees in advance.
3. It is necessary for the teacher to "appoint" in an informal, yet clear, way the tutors, -usually among the older students.
4. It is recommended that there is a good preparation of the tutoring' s structure in respect to both, time and cognitive material.
5. It is useful for the teacher to give the appropriate guidance to the tutors, well in advance.
6. It is useful for the teacher to supervise the tutor discreetly, while tutoring.

Once these requirements are met, teachers can apply peer tutoring within the framework of mixed age groups, taking advantage of the cognitive maturity of older students whose cognitive status is still close to that of their younger colleagues. In mixed age groups, older students can very successfully play the role of tutors for their younger

group mates if their teachers appropriately support them. In this case all the advantages concerning structured peer tutoring are well-revealed.

CO-OPERATIVE AND SELF REGULATED LEARNING

WHAT IS COOPERATIVE LEARNING?

Cooperative learning aims to organize class activities. Also, it aims to into a social and educational learning experience. Also in it, students work together in groups to perform a task. John Dewey the education reformer introduced this theory. It is the responsibility of the teacher to carefully select the group. Each member is responsible for learning. And also, to teach what is taught to his/her teammates.

Cooperative learning is an activity which helps students to work in groups. Also, it enables them to learn and teach group members. Also, the success of each member depends on the group's success.

Cooperative learning is a teaching method. It arranges and mixes students of different level of ability and learning into groups. Also, it focuses on group success rather than individual success.

TYPES OF COOPERATIVE LEARNING

Cooperative learning divides into 3 parts:

- Formal learning
- Informal learning
- Cooperative learning

1. Formal Learning

The formal group assigns tasks and projects. Also, they stay together until the assignment completes. The group has a clear structure. Besides, the teacher selects the groups. Depending on the assignments, the group can be heterogeneous and homogeneous. Likewise, three to five-person groups is believed to be most productive.

2. Informal Learning

These are just the opposite of formal learning. Also, they are not structured very well. Typically they involve activities that take few minutes. In addition, they usually have two to three members. They are suitably used for rapid activities like check for understanding, quick problem solving or review, etc. these help in changing the format of the lecture. Also, they give students a few minutes to talk about a concept with a go over.

3. Cooperative Learning

They are usually long term support group. Also, their minimum duration is a semester but they can last for years. Due to their duration, they generally become friends or acquaintances. The members support and cooperate with each other outside the group.

Elements of Cooperative Learning

Basically, there are five elements of cooperative learning

1. Positive Interdependence

It means that they have clear goals or target. Also, their effort not only helps oneself but the group. Positive interdependence is committed to personal success. as well as the success of every member of the group.

2. Individual and Group Accountability

The group is accountable for its actions. Also, the members are accountable for their fair contribution. And also for achieving the group goal. Besides no one can copy or steal others work. Everyone's performance must be assessed. And its results should be given to the group.

3. Small group and Interpersonal skills

Small group and interpersonal skills require carrying out as part of a group. Basically, they are teamwork skills. Self-motivation, efficient leadership, decision making, trust building, communication, and conflict managing are basic skills.

4. Promotive face-to-face Interaction

This means that students share each other success by dividing resources. Also, to learn they help, give confidence, support, and admire each other's work. Educational and individual both are part of this common goal.

5. Group Processing

Group members require experiencing free to communicate frankly with others. Also, they feel each other's concern and make merry at accomplishments. Besides, they should converse about achieving the goal and maintaining helpful working relations.

WHAT IS SELF- REGULATED LEARNING?

Self-regulated learning refers to how students become masters of their own learning processes. Neither a mental ability nor a performance skill, self-regulation is instead

the self-directive process through which learners transform their mental abilities into task-related skills in diverse areas of functioning, such as academia, sport, music, and health. It refers to one's ability to understand and control one's learning environment. Self regulation abilities include goal setting, self monitoring, self-instruction, and self-reinforcement.

Effective learners are self-regulating, analyzing task requirements, setting productive goals, and selecting, adapting or inventing strategies to achieve their objectives. These learners also monitor progress as they work thorough the task, managing intrusive emotions and waning motivation as well as adjusting strategies processed to foster success. These are the students who ask questions, take notes, and allocate their time and their resources in ways that help them to be in charge of their own learning (Paris & Paris, 2001).

Specifically, self regulated learning consists of three components: cognition, meta cognition, and motivation. The cognition component includes the skills and habits that are necessary to encode, memorize, and recall information as well as think critically. Within the meta cognition component are skills that enable learners to understand and monitor their cognitive processes. The motivation component surfaces the beliefs and attitudes that affect the use and development of both the cognitive and metacognitive skills.

SELF REGULATED LEARNING SKILLS

Self-regulated learning skills are essential tools for learning. Nevertheless, educators rarely teach them explicitly. This is why many students end up lacking independence, motivation, persistence, and a positive feeling of well-being during their studies. For educators to transmit these skills effectively to their students, it's important for them to be intimately familiar with the most important self-regulation mechanisms.

Students go through three main stages when they regulate their own learning:

- During the planning stage, the students establish their goals and standards. They should be able to meet them within the span of a specific task, session, or course. This stage involves the student's perception of the learning environment.
- During the performance stage, the students demonstrate their commitment to their learning experience. At this point, they monitor their own learning. They can compare their progress with the standards they established in the planning stage.

- During the reflection stage, the students think about and evaluate their learning experience. This includes reflecting over feedback and mentally storing ideas and concepts for use in future learning.

5.6 Teacher Effectiveness and Competence

Good reaching depends upon the attitude and the skill of a teacher. The teacher who has faith in democracy, who believes that children by nature are good, who has confidence in the reasonableness of the youngsters and who is full of hope for the future of mankind, will teach in a completely different way than a teacher who staunchly believes in a particular faith, who believes that mankind is born out of sin and who is determined to keep them under strict discipline.

An examinations result is one tool with which teaching effectiveness is determined. Another parameter can be the supervisor's or administrator's opinion about the teacher's effectiveness. Popularity among the pupils can be considered one of the determinants of effectiveness, since mutual affection has a good effect on the learning outcomes.

By and large, most research efforts have attempted to probe one or more of the following dimensions of teacher personality and behaviour: (1). Personality characteristics, (2).instructional procedures and (3). Classroom interactional styles.

The role of the teacher is broadening and becoming more demanding. Teachers are expected to use a wide variety of methods, tools and approaches and to tailor them to the learners' needs. They also need to have competences and skills necessary to create a positive classroom environment and work collaboratively with other stakeholders within and outside the school in order to provide timely support to learners.

There are some specific new skills and competences that teachers are expected to acquire or improve:

- Teachers need a positive attitude toward the benefits of having a diverse set of learners in their classes. Teachers need to be able to select from a wide variety of teaching techniques and active learning strategies (including: enquiry-based and project-based teaching, collaborative learning, etc.
- Teachers need to be informed about the latest research and evidence-based best practices in areas relevant to their work. Teachers who are lifelong learners also consider professional challenges as part of their learning process. They also gain

knowledge and information that they can share with other teachers and in their daily practice.

- Teachers need to integrate formative assessment methods in teaching and learning **to provide learners with feedback and support progress toward learning goals**.
- Teachers need competences to diagnose risk factors, which may include unfavorable school and classroom climates, poor teacher-students-relationships, negative peer-influence, truancy, illness, learning difficulties, etc. In addition, teachers should have a comprehensive knowledge of a range of effective interventions to prevent early school leaving.
- Teachers need to be able to effectively communicate and **build powerful, positive and trust-based relationships** with learners from all backgrounds. They should be able to deploy appropriate classroom management strategies, and techniques to resolve conflicts and prevent bullying and have interpersonal competences expertise to promote a positive school and classroom climate.
- Teachers who have a positive attitude and the ability to work in multi-disciplinary professional teams **and professional communities** co-develop teaching and learning approaches, act to prevent the process of early school leaving and are less likely to feel isolated. School leaders have a key role to play by providing the budget, time and space to support professional communities, school development projects and continuing professional development.
- Teachers should be encouraged and supported to **lead and to act as change agents and mentors within and beyond the classroom**. Teacher leadership can be characterized as a collaborative effort in which teachers co-develop expertise and promote professional development to improve their own and their peers' educational practices and the school climate. Their aim is ultimately to improve student retention and performance.
- Teachers should have the ability to **communicate** effectively, **and to cooperate with and involve parents** in the learning and development of their children.
- Teachers should have the **competence**, willingness to cooperate, and **creativity to involve external partners including local employers**.
- Teachers need to have the knowledge and awareness of the cognitive, social and behavioural development of students (e.g. well-being).

5.7 Guiding Children With Disabilities

You might have come across students with varying abilities to learn – some learn fast, some learn slowly and some have pronounced learning problems. You, as a teacher, will have to deal with these problems in your daily classroom transactions. To you, each child is an individual who needs to be helped to learn and perform. This unit aims at sensitizing you to their problems and how you as a teacher can guide students having these problems.

What is disability?

A disability is any continuing condition that restricts everyday activities. The Disability Services Act (1993) defines 'disability' as meaning a disability:

- which is attributable to an intellectual, psychiatric, cognitive, neurological, sensory or physical impairment or a combination of those impairments
- which is permanent or likely to be permanent
- which may or may not be of a chronic or episodic nature
- which results in substantially reduced capacity of the person for communication, social interaction, learning or mobility and a need for continuing support services.

With the assistance of appropriate aids and services, the restrictions experienced by many people with a disability may be overcome.

Types of disabilities

The main categories of disability are physical, sensory, psychiatric, neurological, cognitive and intellectual. Many people with disability have multiple disabilities.

A physical disability is the most common type of disability, followed by intellectual and sensory disability. Physical disability generally relates to disorders of the musculoskeletal, circulatory, respiratory and nervous systems.

Sensory disability involves impairments in hearing and vision.

Neurological and cognitive disability includes acquired disability such as multiple sclerosis or traumatic brain injury. Intellectual disability includes intellectual and developmental disability which relate to difficulties with thought processes, learning, communicating, remembering information and using it appropriately, making judgments and problem solving. Intellectual disability is the result of interaction between developmentally attributable cognitive impairment, attitudinal and environmental barriers.

Psychiatric disorders resulting in disability may include anxiety disorders, phobias or depression.

Types of Disabilities – RPwDs Bill 2016

1. Blindness
2. Low Vision
3. Leprosoy Cured persons
4. Locomotor Disability
5. Dwarfism
6. Intellectual Disability
7. Mental Illness
8. Cerebral Palsy
9. Specific Learning Disabilities
10. Speech and Language disability
11. Hearing Impairment (Deaf and Hard of Hearing)
12. Muscular Dystrophy
13. Acid Attack Victim
14. Parkinson's disease
15. Multiple Sclerosis
16. Thalassemia
17. Hemophilia
18. Sickle Cell disease
19. Autism Spectrum Disorder
20. Chronic Neurological conditions
21. Multiple Disabilities including Deaf Blindness

PROVISION OF FACILITIES

The Rights of Persons with Disabilities Act, 2016

the Act stipulates that all educational institutions funded or recognized by appropriate Government and local authorities should provide inclusive education to the children with disabilities and towards that end shall –

1). Admit them without discrimination and provide education and opportunities for sports and recreation activities equally with others;

ii) Make building, campus and various facilities accessible;

iii) Provide reasonable accommodation according to the individual's requirements;

iv) .Provide necessary support individualized or otherwise in environments that maximize academic and social development consistent with the goal of full inclusion;

v) ensure that the education to persons who are blind or deaf or both is imparted in the most appropriate languages and modes and means of communication;

vi) Detect specific learning disabilities in children at the attainment levels and completion of education in respect of every student with disability;

vii) Monitor participation, progress in terms of attainment levels and completion of education in respect of every student with disability;

viii) Provide transportation facilities to the children with disabilities and also the attendant of the children with disabilities having high support needs.

The appropriate Government and the local authorities are further required –

a) to conduct survey of school going children in every five years for identifying children with disabilities, ascertaining their special needs and the extent to which those are being met;

b) to establish adequate number of teacher training institutions;

c) to train and employ teachers, including teachers with disability who are qualified in sign language and Braille and also teachers who are trained in teaching children with intellectual disability;

d) to train professionals and staff to support inclusive education at all levels of school education;

e) to establish adequate number of resource centres to support educational institutions at all levels of school education;

f) to promote the use of appropriate augmentative and alternative modes including means and formats of communication. Braille and sign language to supplement the use of one's own speech to fulfill the daily communication needs of persons with speech, communication or language disabilities and enables them to participate and contribute to their community and society.

g) to provide books, other learning materials and appropriate assistive devices to students with benchmark disabilities free of cost up to the age of eighteen years;

h) to provide scholarships in appropriate cases to students with benchmark disability;

i) to make suitable modifications in the curriculum and examination system to meet the needs of students with disabilities such as extra time for completion of examination paper, facility of scribe or amanuensis, exemption from second and third language courses; and

j) to promote research to improve learning.

5.8 Let us sum up

5.9 Unit End Exercise

5.10 References

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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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