

Syllabus**S.Y.B.A.****EDUCATION PAPER - II, EDUCATIONAL PSYCHOLOGY****SECTION - I****Unit 1:**

- A) Nature, meaning, scope and functions of Educational Psychology.
- B) Methods of Studying Behavior - Introspection, Observation and Experimental method.

Unit 2:

- A) Growth and Development – Meaning, stages; Mental, Emotional and Social Development during - childhood, adolescence.
- B) Individual Differences - Meaning, significance and causes.

Units 3:

- A) Learning – concept, characteristics, learning process, learning curve.
- B) Theories of Learning - Trial and Error, Classical Conditioning.
- C) Transfer of Learning - Concept, types, educational implications.

Unit 4: Factors affecting learning (only concept, educational implications)

- A) Attention
- B) Perception
- C) Motivation

Practical: To perform the following experiments and record them:

- I) Learning curve
- II) Transfer of learning
- III) Motivation
- IV) Distraction of Attention
- V) Division of Attention
- VI) Perception

SECTION - II**Unit 5: Mental Processes Related to Learning**

- A) Thinking – concept, types - divergent, convergent, critical reflective, lateral.
- B) Memory - Concept, types, factors affecting memory.
- C) Forgetting - Concept, types, causes, educational implications.

Unit 6: Intelligence and Creativity :

- A) Concept, Gardner's Theory of Multiple Intelligence.
- B) Emotional Intelligence - concept, educational implications;
- C) Creativity - concept, educational implications.

Unit 7:

- A) Personality - Concept ; Self concept, Self Esteem;
- B) Mental Health - Concept and importance
- C) Maladjustment - Causes and prevention

Unit 8: Group Psychology : Group Dynamics - meaning, process, importance; Sociometry.

Practical : To perform the following experiments and record them.

- i) Concept formation
- ii) Lateral thinking
- iii) Memory - Recall and Recognition
- iv) Memory-Rote and Logical
- v) Creativity
- vi) Sociometry

Objectives:

- i. To acquire knowledge of the characteristics of growth and development during childhood and adolescence.
- ii. To develop an understanding of the nature, scope and methods of educational psychology.
- iii. To develop an understanding of the nature, concept and factors affecting learning.
- iv. To develop and awareness of the influence of intelligence, creativity and personality on learning.
- v. To acquaint learners with the concept and process or group dynamics.

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A) MEANING, NATURE, SCOPE AND FUNCTIONS OF EDUCATIONAL PSYCHOLOGY

Unit Structure:

- 1.0 Objective
- 1.1 Introduction
- 1.2 Meaning and Definition of Educational psychology
- 1.3 Nature of Educational Psychology
 - Check your progress
- 1.4 Scope of Educational Psychology
- 1.5 Functions of Educational Psychology
- 1.6 Unit End Exercise

1.0 OBJECTIVE

After going through this unit carefully you should be able to

- Define Educational Psychology.
- Explain the nature of Educational Psychology.
- List out the functions of Educational Psychology.

1.1 INTRODUCTION

This is the first unit of the second paper of Psychology of Learning. This course deals with the importance and contribution of educational psychology on the theory and practice of education. Every teacher is confronted with the problem of individual differences in the classroom. The purpose of this unit is to define the concept of educational Psychology. It describes meaning and nature of Educational Psychology. An attempt has also been made to describe the characteristics and meaning of learning.

1.2 MEANING AND DEFINITION OF EDUCATIONAL PSYCHOLOGY

Educational Psychology consists of two words Psychology and Education. While General Psychology is a pure science, Educational Psychology is its application in the field of education with the aim of socializing man and modifying his behaviour. According to Crow and Crow, Educational Psychology describes and explains the learning experiences of an individual from birth through old age. Skinner defines Educational Psychology as “that branch of Psychology which deals with teaching and learning”

Stephen – “Educational Psychology is the systematic study of the educational growth and development of a child.”

Judd – “Educational Psychology is the Science which explains the changes that take place in individuals as they pass through the various stages of development.”

Peel- “Educational Psychology is the science of Education.”

Educational psychology is one of the branches of applied psychology concerned with the application of the principles, techniques and other resource of psychology to the solution of the problems confronting the teacher attempting to direct the growth of children toward defined objectives. More specifically, we can say educational psychology is concerned with an understanding of:

- The child - his development, his need and his potentialities
- The learning situation including group dynamics and its effect on learning
- The learning process-its nature and the ways to make it effective. Stated differently, the Central theme of Educational Psychology is Psychology of learning.

PSYCHOLOGY OF LEARNING

This area is concerned with problems like: How do children acquire skills? When is learning more effective? What are the factors that help the learning process? How do we measure the amount of learning? Are there any economic methods of memorizing? Why do we forget? Can memory be improved? Does the study of Sanskrit help the study of Hindi?

Psychology helps the teacher to get answers to these questions. It tells us that learning becomes more effective if factors like motivation and interest are taken into consideration by every teacher. The knowledge of psychology has helped the teacher in modifying her approach to the teaching learning process.

The study of educational Psychology has brought about changes in the approaches to education and therefore we have child centred education. Psychological principles are used in formulation curriculum for different stages. Attempts are made to provide subjects and activities in the curriculum, which are in conformity with the needs of the students, their developmental characteristics, learning patterns, and also needs of the society.

1.3 NATURE OF EDUCATIONAL PSYCHOLOGY

Following are the important characteristics of the nature of educational psychology:

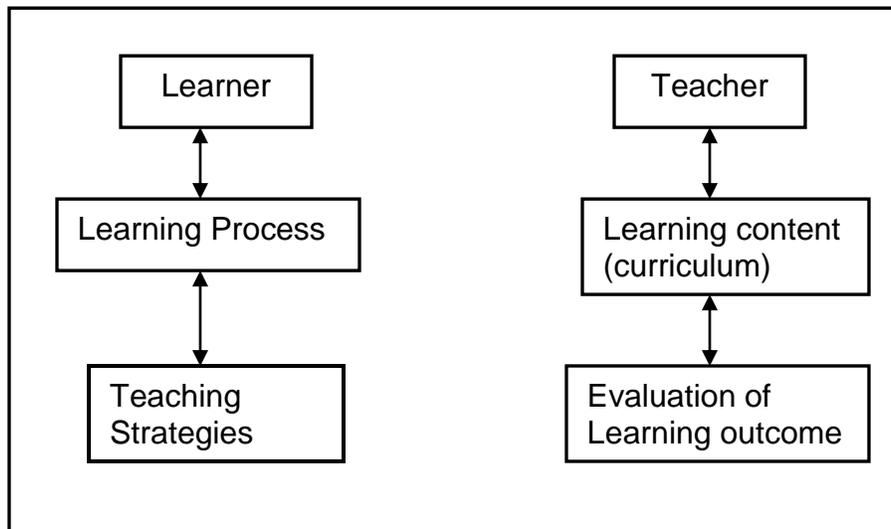
- It is an applied branch of fundamental Psychology.
- It combines two fields i.e. education and psychology.
- It is the scientific study of human behaviour in educational situations.
- It is concerned with these factors, principles and techniques which relate to the various aspects of a child's growth and development.
- It is concerned with learning situation and process by which learning can be more efficient and effective.
- Educational Psychology, draws heavily from various branches of psychology, biology sociology and anthropology
- Educational Psychology is not as exact as natural sciences since the human behavior cannot be predicated exactly, because it is dynamic.
- Educational Psychology is a science of education dealing primarily with how, when and what of education.
- It is not a normative a science as it is not concerned with the value of education and does not concern itself with 'What ought to be'. It only describes what it is, it is an applied positive science.
- While psychology deals with the behaviour of all individuals in all walks of life, Educational Psychology limits its dealing with the behaviour of the pupil in relation to educational environment.
- It does not concern with the what and why of education. It gives the necessary knowledge and skill (Technical Guidance) for giving education to the pupil in a satisfactory way.

- **Check your Progress**

1. Explain the meaning and definition of Educational Psychology
2. Explain the meaning and nature of Educational Psychology

1.4 SCOPE OF EDUCATIONAL PSYCHOLOGY

SCOPE OF EDUCATIONAL PSYCHOLOGY



Five major areas covered by Educational Psychology are:

- The Learner
- The Learning Process
- The Learning Situation
- The Teaching Situation
- Evaluation of Learning Performance
- The Teacher

The Learner

Educational Psychology acquaints us with need of knowing the learner and deals with the techniques of knowing him well. Following are the topics studies included in it:-the innate abilities

and capabilities of the individual and their measurements, the overt, covert, conscious as well as unconscious behaviour of the learner, the characteristics of his growth and development at each stage beginning from childhood to adulthood.

The Learning Process

After knowing the learner and deciding what learning experiences are to be provided, the emerging problem is to help the learner in acquiring these learning experiences with ease and confidence.

Hence, it deals with the nature of learning and how it takes place and contains the topics such as laws, principles and theories of learning; remembering and forgetting, perceiving, concept formation, thinking, reasoning process, problem solving, transfer of training, ways and means of effective learning etc.

Learning Situation

It also deals with the environment factors and learning situation which come midway between the learner and the teacher. Topics like classroom climate and group dynamics techniques and aids which facilitate learning, evaluation techniques, and practices, guidance and counseling etc. which help in the smooth functioning of the teaching learning process.

Teaching Situation

It suggests the techniques of teaching. It also helps in deciding what learning situation should be provided by the teacher to the learner according to his mental and physical age, his previous knowledge and interest levels. By describing the learner's characteristics, what teaching aids are appropriate for the particular subject can be decided.

Evaluation of Learning Performance

The main objective of education is all-round development of the learner. It includes cognitive, affective and psychomotor aspects of personality. Educational Psychology suggests various tool and techniques for assessment and evaluation such as performance test, oral test and written test. It does not stop at measurement only. After the testing, results of the test are analysed, causes for poor performance, backwardness in any aspect of development is corrected by guidance and counselling in study habits, examination techniques and learning styles. These are analysed and the learner is helped so that he can overcome the difficulties.

The Teacher

Educational Psychology emphasizes the need of knowing the self for a teacher to play his role properly in the process of education. It throws light on the essential personality traits, interests, aptitudes, the characteristics of effective teaching etc., so as to inspire, help teacher handle the stress, conflict and anxiety by giving insight into their own personality.

1.5 FUNCTIONS OF EDUCATIONAL PSYCHOLOGY

- to provide a thorough knowledge of the nature of the child
- to provide an understanding of the nature, aims and purposes of education.
- to acquire familiarity with the technical vocabulary and to further an understanding and an appreciation of the scientific procedures by which the data of educational psychology are obtained
- to provide a significant knowledge of developmental process with particular emphasis upon the promotion, guidance and control of mental and moral aspects.
- to provide an understanding of the principles governing learning, together with knowledge of the techniques for guiding improvement in learning and their application to the practical problems in the classroom.
- to present the theories underlying the measurement and evaluation of mental abilities, aptitudes, achievements, interest and personality organization.
- to present the principles and conclusions regarding the prevention of all types of maladjustments together with the approved practices for achieving satisfactory adjustments
- the “Culminating Function” - to inculcate in the prospective teacher the realization that the most essential purpose of teaching is that the student learn.

1.6 UNIT END EXERCISES:

1) Knowledge of Educational Psychology helps teacher in

- A) Obtaining the B.Ed. degree
- B) Understanding ethics.
- C) Improving the socio-emotional climate of the class.
- D) Teaching the special type of children.

2) Educational Psychology aims to

- A) To decide the future of the learner
- B) To forecast the future behaviour of the learner.
- C) Improve learning situation by protecting learning's needs and interest.
- D) To control the Educational Programme.

3) Explain the meaning and nature of educational psychology

4) Define educational psychology. Discuss the scope of educational psychology.

5) Explain the nature and functions of educational psychology



B) METHODS OF STUDYING PSYCHOLOGY OF LEARNING

**A] INTROSPECTION B] OBSERVATION
C] EXPERIMENTAL**

Unit Structure:

- 1.7 Objectives
- 1.8 Introduction
- 1.9 Introspection Method
 - Check your progress
- 1.10 Observation Method
 - Check your progress
- 1.11 Experimental Method
 - Check your progress
- 1.12 Unit End Exercise
- 1.13 Suggested Readings

1.7 OBJECTIVES

After reading this unit, you will be able to:

- Describe the Introspection method
- State the merits and demerits of Introspection method
- Describe the observation method
- State the merits and demerits of observation method
- Explain the steps of experimental method
- State the merits and demerits of experimental method

1.8 INTRODUCTION

Dear students

In the preceding section, we have analysed the nature, definition, scope and function of psychology of learning. We have also discussed the psychological concept of learning.

In this unit, we will describe the important methods of studying psychology of learning. All the methods to study psychology of learning are basically methods of general psychology.

A brief review of the development of these methods will be helpful for you to understand the importance of the subject in greater perspective.

The first effort of conducting systematic experimental studies in psychology was started in 1879 in Germany with the establishment of first laboratory of psychology by William Wundt.

The next important method of collecting data was evolved with the development of psychoanalysis as an independent system of psychology by Sigmund Freud who emphasized importance of the 'unconscious' in understanding behaviour. In the second decade of 20th century, psychology developed as an objective science of behaviour by the efforts of Pavlov Watson and Guthrie. Experimental and observation methods were developed to collect data to study behaviour. Simultaneously testing movement started with the introduction of statistics in psychology.

Here we will study only the following methods of studying psychology of learning. They are:

- A] Introspection method
- B] Observation method
- C] Experimental method

1.9 INTROSPECTION METHOD

At times, when you experience an emotion like anger or fear, you begin to think of reasons for that state of mind of yours.

You say, "Why have I been annoyed over this or that? Why have I been afraid of such things"? The analysis of your emotional state may take place simultaneously with the emotion or it may be done after the emotional state is over. In whatever manner it is done, it gives you an understanding, though rudimentary of your mind. This method of probing into your mental processes is a method of introspection used by psychologists in a much-refined manner.

Let us see in detail what do we mean by Introduction along with its merits and demerits.

What we mean by introspection:

Introspection is a method of self-observation. The word 'Introspection is made up of two Latin words. "Intro" meaning within and "Spection" meaning looking. Hence it is a method where an individual is looking within one self.

Angel considered it as "looking inward". In introspection, the individual peeps into his own mental state and observes his own mental processes.

Stout considers that 'to introspect' is to attend to the working of one's own mind in a systematic way'.

Introspection method is one of the oldest methods to collect data about the conscious experiences of the subject. It is a process of self – examination where one perceives, analyses and reports one's own feelings. Let us learn this process with the help of an example, suppose you are happy and in the state of happiness you look within yourself. It is said you are introspecting your own mental feelings and examining what is going on in your mental process in the state of happiness. Similarly, you may introspect in a state of anger or fear; etc Introspection is also defined as the notice, which the mind takes of itself.

Let us see the stages of introspection.

There are three clear stages in introspection.

1. During the observation of external object, the person begins to ponder over his own mental state. For example While listening to music, which is to him pleasant or unpleasant, he starts thinking about his own mental state.
2. The person begins to question the working of his own mind. He thinks and analyses: Why has he said such and such thing? Why has he talked in a particular manner? And so on.
3. He tries to frame the laws and conditions of mental processes: He thinks in terms of improvement of his reasoning or the control of his emotional stages. This stage helps in the advancement of our scientific knowledge.

Characteristics of Introspection:

Introspection, being self- observation, has the following characteristics:

1. The subject gets direct, immediate and intuitive knowledge about the mind.

2. The subject has actually to observe his own mental processes. He cannot speculate about them.

Introspection Method was widely used in the past. Its use in modern time is being questioned. It is considered unscientific and not in keeping with psychology which has recently emerged out as a positive science. However it is still being used by psychologists and though its importance is being questioned it is not totally discarded.

Merits of Introspection Method:

- It is the cheapest and most economical method of studying behaviour. We do not need any apparatus or laboratory for its use.
- This method can be used any time and anywhere. You can introspect while walking, traveling, sitting on a bed & so on.
- It is the easiest method and is readily available to the individual.
- The introspection data is first-hand as the person himself examines his own activities.
- Introspection has generated research which gradually led to the development of more objective methods.
- It is still used in all experimental investigation.
- It is the only method with the help of which an individual can know his emotions and feelings.

William James has pointed out the importance of this method in these words. "Introspective observation is what we have to rely on first and foremost and always. The word introspection can hardly be defined-it means, of course, looking into our own minds and reporting what we there discover. Everyone agrees that there are states of consciousness. So far as I know, the existence of such states has never been doubted by my critics, however skeptical in other respects they may have been."

Limitations of Introspection Methods:

- In introspection, one needs to observe or examine one's mental processes carefully in the form of thoughts, feeling and sensation. The state of one's mental processes is continuously changing. Therefore when one concentrates on introspecting a particular phase of one's mental activity that phase passes off. For example when you get angry at something and afterwards sit down to introspect calmly, the state of anger is sure to have passed off and so what you try to observe is not what is happening at that time with yourself but what had happened sometime before.

- The data collected by introspection cannot be verified. An individual may not pass through the same mental state again. There is no independent way of checking the data.
- The data collected by introspection lacks validity and reliability. It is impossible to acquire validity and exactness in self-observation of one's own mental processes.
- The data collected by introspection is highly subjective. It has danger of being biased and influenced by preconceptions of the individual.
- The observer and the observed are the same. Hence there is ample scope for the individual to lie deliberately and hide the facts to mislead others.
- Introspection cannot be applied to children, animal and abnormal people.
- Introspection is logically defective because one and the same person is the experimenter and observer. It is not possible for the same individual to act as an experimenter as well as an observer.

Thus introspection is logically defective.

Conclusion:

The limitations of introspection can be overcome by practice and training, by remaining alert during introspection and by comparing results obtained by experts.

• **Check Your Progress:**

Note a] Write your answers in the space given below.

b] Compare your answers with those given at the end of the unit.

1] Fill in the blanks:

A] Introspection is a method of -----

B] The word introspection is made up of two Latin words -----
and

1.10 OBSERVATION METHOD

We observe so many things in nature. We also observe the action and behaviour of others and form our own notions about these persons. We look at other persons, listen to their talks and try to infer what they mean. We try to infer the characteristics, motivations, feelings and intentions of others on the basis of these observations. So let us study about Observation method employed by psychologists in detail.

With the development of psychology as an objective science of learning behaviour, the method of introspection was replaced by careful observation of human and animal behaviour to collect data by research workers.

In introspection we can observe the mental process of ourselves only, but in observation, we observe the mental processes of others. Hence Observation is the most commonly used method for the study of human behaviour.

Meaning of Observation

Observation literally means looking outside oneself. Facts are collected by observing overt behaviour of the individual in order to locate underlying problem and to study developmental trends of different types.

The overt behaviour is the manifestation of covert conditions within the individual. The study of overt behaviour gives indirect clues to the mental conditions of the individual. Observation means 'perceiving the behaviour as it is'

In the words of Good, " Observation deals with the overt behaviour of persons in appropriate situations."

Observation has been defined as "Measurement without instruments."

For example students in a classroom have been labeled as good, fair or poor in achievement and lazy or diligent in study etc. on the basis of observation. Observation is indirect approach to study the mental processes of others through observing their external behaviour. For example if someone frowns, howls, grinds his teeth, closes his fists, you would say that the person is angry by only observing these external signs of his behaviour.

In the process of observation, following four steps are generally required:

1. Observation of behaviour:

The first step involved in the method of observation is directly perceiving or observing the behaviour of individuals under study. For example, if we want to observe the social behaviour of children we can observe it when they assemble and play.

2. Recording the behaviour observed:

The observation should be carefully and immediately noted and recorded. Minimum time should be allowed to pass between happening and recording. It will make the observation more objective.

3. Analysis and Interpretation of behaviour:

When the notes of behaviour observed are completed, they are analysed objectively and scientifically in order to interpret the behaviour patterns.

4. Generalisation:

On the basis of analysis and interpretation of the data collected with the help of observation method, it is possible to make certain generalization. Social development and behaviour of children have been described by Child Psychologists on the basis of generalization based on analysis and interpretation of the data gathered through the observation method.

Types of Observation:

1. Natural Observation:

In natural observation we observe the specific behavioural characteristics of children in natural setting. Subject do not become conscious of the fact that their behaviour is being observed by someone.

2. Participant – Observation:

Here the observer becomes the part of the group, which he wants to observe. It discloses the minute and hidden facts.

3. Non-Participant Observation:

Here the observer observes in such a position, which is least disturbing to the subject under study, the specific behaviour is observed in natural setting without subjects getting conscious that they are observed by some one. Non-participant observation permits the use of recording instruments.

4. Structure Observation:

Here the observer sets up a form and categories in terms of which he wishes to analyse the problem. The observer always keeps in view

- a] A frame of reference
- b] Time units.
- c] Limits of an act

5. Unstructured Observation:

This is also called as uncontrolled or free observation. It is mainly associated with participant observation in which the observer assumes the role of a member of the group to be observed. Here the individual is observed when he is in his class,

playground or when he is moving about with his friends and class follows without knowing that he is being observed.

Observation is very useful method to study child and his behaviour. Observation method, being a commonly used method in psychology, has following merits:

Merits of Observation Method

1. Being a record of actual behaviour of the child, it is more reliable and objective than introspection.
2. It is an excellent source of information about what actually happens in classroom.
3. It is a study of an individual in a natural situation and is therefore more useful than the restricted study in a test situation.
4. The method can be used with children of all ages. Younger the child, the easiest it is to observe him. This method has been found very useful with shy children.
5. It can be used in every situation-physical activities, workshop and classroom situations.
6. It is adaptable to both the individual and the groups.

Although observation is regarded as an efficient method for psychological studies, it suffers from the following drawbacks limitations:

Limitations:

1. There is great scope for personal prejudices and bias of the observer. The observers interest, values can distort observation.
2. Records may not be written with hundred percent accuracy as the observations are recorded after the actions are observed. There is some time lag.
3. The observer may get only a small sample to study behaviour. It is very difficult to observe everything that the student does or says. As far as possible observation should be made from several events.
4. It reveals the overt behaviour only- behaviour that is expressed and not that is within.
5. It lacks replicability as each natural situation may occur only once.

Considering the drawbacks an observation method, psychologists have suggested various guidelines to be followed for making good observation. Some of these are essential guidelines for making good observation.

Essential guidelines for making good observation

1. Observe one individual at a time. It is desirable to focus attention on just one individual at a time in order to collect comprehensive data.
2. Have a specific criteria for making observations. The purpose of making observation should be clear to the observer before he or she begins to observe so that the essential characteristics or the behaviour of the person fulfilling the purpose can be noted.
3. Observations should be made over a period of time. To have a real estimate of the true behaviour of a person it should be observed as frequently as possible. A single observation will not be sufficient to tell us that this is the characteristic of the individual.
4. The observations should be made in differing and natural situations in natural settings to increase its validity. For example, a pupil's behaviour in the classroom may not be typical of him; therefore he should be observed in a variety of settings to know the behaviour most typical of the person.
5. Observe the pupil in the context of the total situation.
6. The observed facts must be recorded instantly, that is just at the time of their occurrence. Otherwise the observer may forget some of the facts and the recording may not be accurate.
7. It is better to have two or more observers.
8. Observations should be made under favorable conditions. The observer should be in position to clearly observe what he or she is observing. There should not be any undue distraction or disturbances. One should also have an attitude free from any biases or prejudices against the individual being observed.
9. Data from observations should be integrated with other data. While arriving at the final conclusion about the individual, one should put together all that we know about the individual from the other sources then we can give an integrated and comprehensive picture of the individual.

These precautions must be borne in mind in order to have reliable observations.

Check Your Progress:

Note: a] Write your answer in the space given below:

b] Compare your answer with those given at the end:

1] A] Fill in the blanks:

1] Observation has been defined as ‘ _____ without _____ ’

B] Mention four types of observation :

1] _____ 2] _____

3] _____ 4] _____

C] List the steps involved in observation method:

1] _____ 2] _____

3] _____ 4] _____

1.11 EXPERIMENTAL METHOD

We studied introspection method and observation method used in psychology of learning. But these methods lack scientific objectivity and validity. Experimental method is the most scientific and objective method of studying behaviour. It is the method, which is responsible for assigning the status of Science to Psychology. Let us learn more about this Experimental method.

In 1879, William Wundt established the first psychological laboratory at Leipzig in Germany. Since then, experimental method in psychology has become popular, Experimental method consists of actions performed under pre-arranged or rigidly controlled conditions.

Here the emphasis is on experimentation. Experimentation is where the investigator controls the educative factors to which a group of children are subjected during the period of inquiry and the investigation observes the resulting achievement.

J. W. Best describes, “Experimental research is the description and analysis of what will be, or what will occur under carefully controlled conditions.”

Basic concepts /essentials of experimental method

- a. Experiments are always conducted in laboratory. Hence the laboratory is essential.
- b. Psychological experiments performed in this method essentially require two people; the experimenter or group of experimenters who perform the experiments and the other is the subject or subjects on whom the experiment is performed.

- c. The key factor in this method is the controlling of conditions or variables. The term 'Variable' means that which can be varied or changed. By controlling the variables we can eliminate the irrelevant conditions and isolate the relevant ones. We thus become able to observe the causal relationship between the phenomena keeping all other conditions almost constant. Let us understand this by an example. If we try to study the effect of intelligence on academic achievement by the experimental method, we will need to determine the causative relation between the two phenomena (variables)- i.e. intelligence and academic achievement. One of these variables, the effect of which we want to study will be called the independent variable and the other the dependent variable. Thus the independent variable stands for cause and the dependent variable is the effect of the cause. Other conditions like study-habits, sex, socio-economic conditions, parental education, home environment, health, past learning, memory etc. which exercise a good impact upon one's achievement, besides one's intelligence, are termed "intervening variables". In Experimentation, all such intervening variables are to be controlled, i.e. they are to be made constant or equalized and the effect of only one independent variable e.g. intelligence (in the present case), on one or more dependent variable is studied. The intervening variables made constant, are hence called as controlled variables.

Steps in the experimental method

The different steps, which are to be followed in conducting a typical experiment.

1. Raising a problem:

In any experiment the first steps is to identify a problem. For example it has been observed that the students cheat in the examinations. To stop this, it many recommend strict supervision. But it has also been seen that even when there is strict supervision there is cheating, hence there crops up the problem of cheating under strict supervision or relaxed supervision. This problem may lead to experimentation.

2. Formulation of a hypothesis:

The next step in experimental method is the formulation of a hypothesis that "Strict supervision may lead to less copying in the examination as compared to the relaxed supervision. "This hypothesis is now to be tested by experiment.

3. Making a distinction between Independent and Dependent variables:

In the example given above, the cheating behaviour of the students will be dependent variable while the nature of supervision will be the independent variable. It is because by changing the supervision the cheating behaviour is expected change. In the present experiment we manipulate the conditions of supervision in order to discover the ways in which they determine the dependent variable that is the cheating behaviour. We may observe the effect of supervision in the experimental situation and also the effect of relaxed supervision under similar conditions and with the same group of students.

4. Controlling the situational variables:

The experiment will not give valid results unless the situational variables are controlled. If the experiment is conducted with different set of students who have been trained in a different manner or have a different value system then the results will be different in comparison to those who have been subjected to experiment earlier. Similarly the other conditions like the person who is supervising the place of supervision etc. have to be controlled. This means that all those conditions, which might affect the dependent variable, are to be controlled. Since, in any experiment there are numerous conditions which are needed to be controlled, it is many a time difficult to do so. Hence we take recourse to various types of experimental designs, which we have described earlier.

5. Analysis of the Results:

Once the experiment is concluded the results are analysed. In our example we may apply simple percentages to find out in which type of supervision a higher percentage of students have copied. Many a times we apply more sophisticated statistics to analyse the results.

6. Verification of Hypothesis:

The last step in the experimental method is the verification of the hypothesis, which we have earlier framed. The result of the experiment exhibits whether the hypothesis is accepted or refuted. We may find that strict supervision leads to less copying. In that case we may conclude that our hypothesis is accepted. If the results are otherwise then our conclusion will be that the hypothesis is refuted.

Experimental Designs:

Experimental method is the most precise, planned, systematic and controlled method of studying behaviour. It uses a systematic procedure called as experimental design. The term

experimental design has two different meanings-one is the experimental design which represents the six basic steps we have referred above which are followed in an experiment. The second meaning of experimental design is selecting an appropriate statistical procedure. Experimental design provides important guidelines to the researcher to carry out his research study. Experimental design ensures adequate controls by avoiding irrelevant causes of variability. The layout of a design depends on the type of the problem the investigator wants to investigate. No one design solves all the problems of a research study.

A variety of experimental designs have been developed by researchers in recent years. These designs differ as these are dependent upon:

- a) The nature of problem
- b) The situation
- c) The subjects and their availability.

Merits of experimental method

Experimental method being most precise and scientific has following merits:

1. Experimental method is the most systematic method or getting reliable data.
2. Experimental method enables accurate observations due to controlled conditions.
3. It allows us to establish cause effect relationship between different phenomena.
4. The results obtained are valid and reliable.
5. The findings of the experimental method are verifiable by other experiments under identical conditions.
6. It helps to protect from the subjective opinions. Hence it provides objective information about the problem.
7. It provides adequate information about the problem.
8. In experimental method, experiments are conducted under vigorously controlled conditions. The experimenter can control the application and withdrawal of independent variables.
9. Experimental method increases ones knowledge or psychological facts in child psychology, social and abnormal psychology.

It is rightly said the experimental method has made psychology a science.

Demerits of the method

Experimental method suffers from various following demerits:

1. Experimental method is a costly and time consuming method as it requires a laboratory and apparatus to conduct it properly.
2. Experiments are conducted in artificially determined pattern of behaviour. In real life situation it is quite different.
3. It needs specialized knowledge and therefore every teacher cannot be expected to conduct the experiment.
4. The scope is limited. All problems of psychology cannot be studied by this method as we cannot perform experiments for all the problems that may come up in the diverse subject matter of psychology.
5. Accurate measurements, in case of human beings, are never possible.
6. It is difficult to always control the independent variable. Therefore it is not possible to create desired conditions in laboratory.
7. It is not possible to reach certainty in matters of social science s including educational psychology.

• Check Your Progress – 3

- Note** a) Write your answer in the space given below
b) Compare your answer with those given at the end.

1 A) Fill in the blanks:

- 1) _____ established at the first psychological laboratory at Leipzig in Germany.
- 2) Psychological experiments require two people.
They are a) _____ b) _____
- 3) The key factor in the experimental method is the controlling of _____
- 4) Experimental method has the following 3 variables
i) _____ ii) _____ iii) _____

B) List the steps involved in experimental method:

- a) _____ b) _____ c) _____
- d) _____ e) _____ f) _____

C) List the different experimental designs employed in experimental Method:

- a) _____ b) _____ c) _____
 d) _____ e) _____

1.12 CONCLUSION

We have learnt, in the above unit, the three methods of studying psychology of learning. But which of the above discussed methods is the best among other three is a difficult questions to be answered. All the methods have their strengths and weakness and possess some unique characteristics, which make them highly specific for use in a particular situation. A wise psychologist should have a keen insight into the nature of his subjects as well as the conditions affecting his work and accordingly select a proper method or methods for the objectives. Study of the behaviour of his subjects much depends upon the sincerity, honesty, ability and experience of the investigator, who should always try to keep himself as scientific and objective as possible and leave no stone unturned for the overall analysis of the behaviour of the subject or nature of the phenomena under study.

1.12 UNIT END EXERCISES:

1. Fill in the blanks:

- a) Introspection is method of self-observation.
 b) The word introspection is made up to two Latin Words "Intro" & "spection".

2. A) Fill the blanks

- 1) Observation has been defined as "Measurements" without "Instruments".
 2) Observation deals with the overt behaviour of persons in appropriate situation.

B) The five types of observation

- 1) Natural observation 2) Participant observation
 3) Non-participant observation 4) Structured observation
 5) Unstructured observation.

C) The steps involved in observation methods are:

- 1) Observation of behaviour
 2) Recording the behaviour observed

- 3) Analysis and interpretation of behaviour
- 4) Generalization

3. A) Fill in the blanks:

- 1) William Wundt established the first psychological at Leipzig in Germany.
- 2) Psychological experiments required two people.
They are a) Experimenter b) Observer
- 3) The key factor in the experimental method is the controlling of variables.
- 4) Experimental method has three following variable
 - i) Independent variable
 - ii) Dependent variable
 - iii) Controlled variable

B) The steps involved in experimental method are:

- a) Raising ;a problem
- b) Formulation of hypothesis
- c) Making a distinction between independent and dependent variable
- d) controlling the situational variables
- e) Analysis of result
- f) Verification of hypothesis

C) The different experimental design employed in experimental Method.

- a) One group design
- b) Two group design
- c) Multi group with one –Independent variable (ANOVA)
- d) Factorial design
- e) Small N design

Textual Questions :

- 1. Describe introspection method along with its merits and demerits?
- 2. How will you use the observation method to study child's behaviour?
- 3. Discuss the essential guidelines for making good observations?
- 4. Discuss the merits and limitations of experimental method?

5. Why is experimental method considered excellent method of collecting data?

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A) GROWTH AND DEVELOPMENT

B) INDIVIDUAL DIFFERENCES

Unit Structure

2.0 Learning Objectives

2.1 Introduction

2.2 A) Growth and Development

2.2.1 The Meaning of Growth and Development

2.2.2 Principles of Growth and Development

- Check Your Progress

2.3 Stages of Development

2.4 Developmental Characteristics of Children and Adolescents:
Physical, Cognitive, Emotional and Social aspects

2.4.1 Developmental Characteristics of Early Childhood (Age 2-6 Years)

2.4.2 Developmental Characteristics of Late Childhood (Age 6-12 Years)

2.4.3 Developmental Characteristics of Adolescents (Age 12-18 Years)

2.5 B) Individual Differences

2.5.1 Meaning, Significance and Causes

- Check Your Progress

2.6 Let Us Sum Up

2.7 Unit End Exercises

2.8 Suggested Readings

2.0 OBJECTIVES

This unit will help you learn the meaning, the broad principles, the stages and developmental characteristics of Growth and Development. After going through this unit, you should be able to:

- Explain the meaning of growth and development.
- Differentiate between growth and development.
- Explain the principles of growth and development.
- Describe the stages of human growth and development.

- Describe the characteristics of each stage of human growth and development.
- Discuss the educational implications of the principles of growth and development.
- Explain the role of the teacher in the facilitation of growth and development during adolescence.
- Explain the meaning of Individual Differences
- Discuss the significance of understanding individual differences.
- Describe the causes of individual differences.

2.1 INTRODUCTION

Human beings keep changing. During their lives, they change in size, appearance and psychological makeup. The way they change differs from individual to individual. However, the fundamental underlying patterns of growth and development remain more or less the same and take place in an orderly way. Each individual, with his unique heredity and the way he is nurtured, determines the way he traverses the broad highway of his life at his rate of progress. He will attain the size, shape, capacities and developmental status in a way, which is peculiar to him at each stages of life.

In this unit, we shall discuss the concept, principles and various stages of growth & development. Children differ in physical, cognitive, social, and emotional growth patterns. They also differ in the ways they interact with and respond to their environment as well as play with affection. Having an understanding of the sequence of growth and development prepares teachers to help and give attention to all the children.

2.2 GROWTH AND 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 behaviour 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. These genetic potentialities are determined by the nature of his biological inheritance. Still there is room for a tremendous range in the ways he uses the genetic potentialities, depending upon the environment that may help or hinder the development of those potentialities.

2.2.1 The Meaning of Growth and Development

The terms growth and development are often used interchangeably. Actually, they are conceptually different. Neither growth nor development takes place all by itself.

Growth refers to quantitative changes in size, which include physical changes in height, weight, size, internal organs, etc. As an individual develops, old features like baby fat, hair and teeth, etc., disappear and new features like facial hair are acquired. When maturity comes, the second set of teeth, primary and secondary sex characteristics, etc., appear. Similar changes occur in all aspects of the personality. During infancy and childhood, the body steadily becomes larger, taller and heavier. To designate this change the term growth is used. Growth involves changes in body proportions as well as in overall stature and weight. The term growth thus indicates an increase in bodily dimensions. However, the rate of growth differs from one part of the body to the other.

Development, by contrast, refers to qualitative changes taking place simultaneously with quantitative changes of growth. It may be defined as a progressive series of orderly, coherent changes. The term progressive signifies that changes are directional, that they lead forward rather than backward. The terms Orderly and 'coherent' suggest that a definite relationship between the changes taking place and those that precede or will follow them. Development represents changes in an organism from its origin to its death, but more particularly the progressive changes that take place from origin to maturity.

Thus, development may be explained as the series of overall changes in an individual due to the emergence of modified structures and functions that are the outcome of the interactions and exchanges between the organism and its environment.

2.2.2 The Principles of Growth and Development

Following are the fundamental principles of growth and development.

(i) Development follows a pattern or a sequence:

Development tends to proceed from the head downward. This is called the **cephalocaudal principle**. According to this principle, the child first gains control of the head, then the arms, then the legs. Infants gain control of head and face movements within the first two months after birth. In the next few months, they are able to lift themselves up using their arms. By 6 to 12 months of age, infants start to gain leg control and may be able to crawl, stand, or walk.

Development also proceeds from the center of the body outward according to the **proximodistal principle**. Accordingly, the spinal cord develops before other parts of the body. The child's arms develop before the hands, and the hands and feet develop before the fingers and toes. Fingers and toes are the last to develop.

(ii) Development proceeds from general to specific responses:

It moves from a generalized to localized behaviour. The newborn infant moves its whole body at one time instead of moving only one part of it. It makes random kicking with its legs before it can coordinate the leg muscles well enough to crawl or to walk.

(iii) Development is a continuous process:

Development does not occur in spurts. Growth continues from the moments of conception until the individual reaches maturity. It takes place at slow regular pace rather than by 'leaps and bounds'. Although development is a continuous process, yet the tempo of growth is not even, during infancy and early years growth occurs swiftly and later it slackens.

(iv) Different aspects of growth develop at different rates

Neither all parts of the body grow at the same rate nor do all aspects of mental growth proceed equally. They reach maturity at different times. Development also depends on maturation. **Maturation** refers to the sequence of biological changes in children. These orderly changes give children new abilities. Much of the maturation depends on changes in the brain and the nervous system. These changes assist children to improve their thinking abilities and motor skills. A rich learning environment helps children develop to their potential.

Children must mature to a certain point before they can gain some skills. For instance, the brain of a four-month-old has not matured enough to allow the child to use words. A four-month-old

will babble and coo. However, by two years of age, with the help of others, the child will be able to say and understand many words. This is an example of how cognitive development occurs from simple tasks to more tasks that are complex. Likewise, physical skills develop from general to specific movements. For example, think about the way an infant waves its arms and legs. In a young infant, these movements are random. In several months, the infant will likely be able to grab a block with his or her whole hand. In a little more time, the same infant will grasp a block with the thumb and forefinger.

(v) Most traits are correlated in development:

Generally, it is seen that the child whose intellectual development is above average is above average in health size, sociability and special aptitudes.

(vi) Growth is complex:

All of its aspects are closely interrelated. The child's mental development is intimately related to his physical growth and its needs.

(vii) Growth is a product of the interaction of the organism and environment:

Among the environmental factors one can mention nutrition, climate the conditions in the home, the type of social organization in which individual moves and lives.

(viii) There are wide individual differences in growth:

Individual differences in growth are caused by differences in heredity and environment.

(ix) Growth is both quantitative and qualitative:

These two aspects are inseparable. The child not only grows in 'size'; he grows up or matures in structure and function too.

(x) Development is predictable:

It is possible for us to predict at an early age the range within which the mature development of the child is likely to fall. However, mental development cannot be predicted with the same degree of accuracy.

• **Check Your Progress**

1) Indicate 'G' for 'growth' and 'D' for 'development' for each of the following statements.

- a) **A** six-month-old baby shows signs of teething.
- b) **A** three-month-old baby begins to turn over and lie on its stomach.

- c) An infant begins to focus its eyes on an object dangling before it.
 - d) A thirteen-year-old boy begins to have hair on his face.
- 2) Write 'T' for 'true' and 'F' for 'false' for the following statements.
- a) A child talking full sentences is part of development.
 - b) The difference in height between two children is due to the different rates of their development
- 3) Differentiate between growth and development.
- 4) Describe briefly the principles of growth and development

2.3 STAGES OF DEVELOPMENT

Any development process proceeds through some stages and each development stage differs from the other. Each stage of development has its characteristic. Psychologists have separated human life span into stages or periods and identified specific changes that may be expected during each stage. The transition from one stage to the next is gradual rather than sudden. The age groups assigned to each stage of the development are general as shown in the Table 1.0.

Table 1.0
Stages of Development

Age Groups (Years)	Stage of Development	Description of Each Stages
Birth to 5	Infancy	Neonate: This stage is a period from birth to two weeks. Babyhood: This stage is of rapid growth and development. There are changes in body proportions as well as intellectual growth. It is called the pre-gang age. In this stage, the child seeks gain control over his environment. He also starts to learn to make social adjustment.

6 to 12	Childhood	This is the primary school age. Here child is expected to acquire the rudiments of knowledge that are considered essential for successful adjustment to adult life. He/She is expected to learn certain essential skills.
12 to 18	Adolescence	This is the period of physiological change. It is the period when children become sexually mature. It is also the period of intensified personal interaction with peers of the same and opposite sex.
18 to 40	Young adulthood	The responsibilities of adulthood include important decisions like choosing a career, a life partner, etc. Young adulthood begins with setting goals and aspirations.
40 to 60	Middle adulthood	After settling down in thirties and having lived through with rooting phase, the individual starts feeling sense of uprooting and dissatisfaction during the forties. A physical decline in the form of wrinkles, thickening waistlines, greying and thinning hair start appearing. The changes are often termed middle life transition, middle-age revolt, mid-career crisis or middle-age slump. It includes the loss of youth and the coming of old age. In women, hormonal changes of menopause (ending of menstruation) generate anxiety and depression.
Over 60	Late adulthood	Aging is a process, which causes loss of vitality. Aged adults are more concerned about their health and death. Their visit to doctors are more frequent. Retirement has the worst impact on aged adults. They gradually lose their sense of meaningfulness in life. Some develop interests in social service and spend their time in financial planning, reading, travelling, visiting religious places and enjoying nature.

2.4 DEVELOPMENTAL CHARACTERISTICS OF CHILDREN AND ADOLESCENTS: MENTAL EMOTIONAL AND SOCIAL ASPECTS

Children and adolescents grow and develop at very different rates. Each individual is unique, with a distinct personality and life experience. For this reason, age is not the only sign of where a particular child or adolescent is in terms of development. The different aspects of development are as follows.

- **Physical development** – genetic make-up, ethnicity, race, gender, nutrition and diet, exercise, sleep patterns, use of tobacco, alcohol or other drugs, stress and stressful life events, environmental toxins and socioeconomic status
- **Mental development** – academic setting, family environment, parent or caregiver involvement, access to early education opportunities, teacher support, personal motivation, gender and cultural or ethnic context
- **Emotional development** – individual temperament, parent and family relationships, support network, life experiences and transitions; media exposure and influence and a tendency toward risk-taking or delinquent behaviours
- **Social development** – peer influence, popularity, community and societal context

2.4.1 Developmental Characteristics of Childhood (Age 6-12 Years)

Physical Development

The child practices, refines, and masters complex gross and fine motor and perceptual-motor skills.

Mental Development

Concrete operational thinking replaces egocentric cognition. The child's thinking becomes more logical and rational. The child develops the ability to understand others' perspectives.

Social Development

Relationships outside the family increase in importance, including the development of friendships and participation in a peer group. The child imitates, learns, and adopts age appropriate social roles, including those that are gender-specific. The child develops an understanding of rules. Rules are relied upon to dictate proper social behaviour and to govern social relationships and activities.

Emotional Development

The child is industrious, purposeful, and goal directed in his/her activities. He/She is confident and self-directed. The child is developing a better sense of himself/herself as an individual, with likes and dislikes and special areas of skill. He/She is capable of introspection. The child evaluates his/her worth by his/her ability to perform. Self-esteem is largely derived from one's perceived abilities.

2.4.2 Developmental Characteristics of Adolescence (Age 12-18 Years)

Physical Development

Physiological changes at puberty promote rapid growth, the maturity of sexual organs, and development of secondary sex characteristics.

Mental Development

During early adolescence, precursors to formal operational thinking appear, including a limited ability to think hypothetically and to take multiple perspectives. During middle and late adolescence, formal operational thinking becomes well developed and integrated in a significant percentage of adolescents.

Social Development

Social relationships in early adolescence are centered in the peer group. Group values guide individual behaviour. Acceptance by peers is critical to self-esteem. Most peer relationships are still same-sex in early adolescence but turn to the opposite sex soon after.

Young adolescents become interested in sexual relationships, but most contact is through groups. Some youth may begin to experiment with sexual behaviour, but many early adolescents are not sexually active with other youth. Social roles are still largely defined by external sources.

During middle and late adolescence, values become individualized and internalized after careful consideration and independent thought.

Friends are more often selected on personal characteristics and mutual interests. The peer group declines in importance, individual friendships are strengthened, and more youth "date" in one-on-one relationships. The youth experiments with social roles and explores options for career choice.

Emotional Development

The early adolescent is strongly identified with the peer group. Youth depend upon their peers for emotional stability and

support and to help mold the youth's emerging identity. Self-esteem is greatly affected by acceptance of peers.

Early adolescents are emotionally fragile with exaggerated effects and frequent mood swings. They are very vulnerable to emotional stress.

During middle and late adolescence, identity is more individualized, and a sense of self develops and stabilizes that is separate from either family or peer group. Self-esteem is influenced by the youth's ability to live up to internalized standards for behaviour. Self-assessment and introspection are common.

• **Check Your Progress**

1) Match the columns of physical development of the following stages:-

A

B

- | | |
|----------------|---|
| 1. Infancy | a. considerable stability is attained. |
| 2. Childhood | b. Physical maturity attained at optimum level. |
| 3. Adolescence | c. Motor & neuromuscular coordination begins. |

2) Match the columns of social development of the following stages:-

A

B

- | | |
|----------------|--|
| 1. Infancy | a. Radical outlook and questioning of the social norms. |
| 2. Childhood | b. Social response directed towards family members. |
| 3. Adolescence | c. Social values, attitudes and interests are developed. |

2) What is a neonate?

- a) A newborn baby b) An irritable baby c) An unloved baby.
d) An abnormal baby.

3) List the main points of physical development in adolescents.

4) Identify the three needs of childhood.

2.5 B) INDIVIDUAL DIFFERENCES: Meaning, Significance and Cause

Another factor to consider in relation to development is the concept of individual differences. Children develop at different rates. This, in turn, creates variations among individuals (i.e., individual differences). Again, these differences can be either qualitative or quantitative. For children in any preschool classroom setting, the differences in temperament, personality, intelligence, achievement, and physical factors such as height and weight, are noteworthy and reflect a wide range of normal variation. Some children grow rapidly and others grow more slowly. There also are racial and gender developmental variations. During the fetal stage, for example, females mature faster than males do. Further, at birth, the skeletal development of females is about 4 weeks ahead of that of males, and African American children show more rapid skeletal maturation than white children do (Puckett & Black, 2004; Russell et al., 2001; Tanner, 1990).

It is important to understand that the concept of individual differences is the basis upon which one child is compared to another. Also, the existence of these differences constitutes the fundamental premise underlying the development of standardized educational and psychological tests. An understanding of individual differences provides the foundation for recognizing normal variations as well as extreme differences among children and, thus, for identifying those who may have special needs. In general, understanding of the various developmental levels is enhanced by familiarity with the concept of individual differences.

2.6.1 Meaning of individual difference

In education, ever since the most ancient times, students have been differentiated on the basis of age as difference in age levels entitles the children to differing levels of education. As the child's age gradually increases, the subjects of his education can be made more complex and difficult. In addition to differences in age, another factor is the difference in levels of intelligence.

Besides this, educational attainments were also considered to be important. In this manner, during the ancient and the medieval periods, individual difference was believed to be the capacity of attaining skills in a particular subject. In modern schools, other kinds of skills and abilities, and peculiarities of personality in individuals are also taken into consideration.

According to Skinner, "Today we think of individual differences as including any measurable aspect of the total personality." From this definition of individual differences it is

evident that it comprehends every aspect of the human personality, albeit all aspects that is in some manner measurable.

Aspects of this nature can be many such as variability, conformity, difference in the rate of learning and development of mutual relationship between the various characteristics of personality, etc. In this manner, various individual differences of physical and mental development, nature, learning ability, specific abilities, interest and personality, etc.

Definition: Individual differences are the variations from one person to another on variables such as self-esteem, rate of cognitive development or degree of agreeableness. Historically, psychological science has overlooked individual differences in favor of focusing on average behavior.

Differences that separate individual from one another and make one as a unique individual in oneself are termed as individual differences.

Osborne considers individual differences as dissimilarity between persons that distinguish them from one another.

The nature of individual differences can be summarized as follows

- 1) Individual differences are differences in the degree : All persons do have common human traits. But the amount and proportions of such traits differ from person to person leading to uniqueness of personality and behaviors. The concept of individual differences refers to quantitative differences found among individuals in respect of a specific traits or various traits.
- 2) Normal distribution of traits: All measures of traits that contribute to individual difference tend to distribute themselves according to the laws of normal probability curve.
- 3) There exist both inter-individual and intra-individual differences: individuals not only differ among themselves with respect to a specific trait but differences may be also noticed within the same individual when he is studied in respect of various traits.

Educational significance of individual difference

Some of the important implications of individual difference in education are the following:

- 1) As far as possible individual method of instruction may be adopted.
- 2) As every student has his peculiar differences individual attention should be paid by the teacher.
- 3) As individuals differ in their interest and abilities a large number of subjects of study should be provided by the school, so that

student may have wide choices in selection of the subject they offer for study.

4) Individual differences call for individualized curriculum, methods of teaching, evaluation techniques etc.

5) Individuals differ widely in their abilities, needs, interests, aptitudes, attitudes, etc. Therefore it is essential that arrangements should be made to provide educational and vocational guidance to the pupils individually

Causes of individual differences are:

1. Difference in Growth Rate: Some children grow rapidly and some grow slowly. Some grow mentally at a faster rate, some at a very slow rate. Some grow physically and mature early; some grow late. The different parts of the organism grow at different rates. Each child has his own growth rate.

2. Difference in Socio-Economic Backgrounds: Some of the differences are caused by differences in socio-economic backgrounds. These differences are seen in pupils' reaction patterns. Differences in socio-economic backgrounds may lead to differences in diet, cultural opportunities, ideals, attitudes and in family behaviour habits.

3. Interaction of Heredity and Environment: *A large number of individual differences* are caused by the interactive process of heredity and environment. To each child, heredity provides a potential. The dynamic forces of the environment act upon that potential in a different way.

4. Physiological Differences: The layman and the scientist both realize and recognise that differences exist among individuals in the innate ability to learn. Certainly, a mongoloid or a micro cephalic do not learn with the facility of a normal individual.

It is a fact though it may not be obvious that among the pupils who appear to be normal, there are also enormous differences in degrees of ability. These differences are attributed to basic physiological differences.

The basic physiological differences may be, for example, due to visual difficulty or hearing difficulty or other sensory disability or glandular dysfunction or dietary deficiency. A child who appears to be normal may be having any or some of these difficulties with the consequent impairment of learning.

For example, visual difficulty which is evidenced by rubbing the eyes, leaning forward to see the board, tilting the head, hearing difficulty which is displayed by turning one side of the head towards the source of sound, asking that questions be repeated, and other sensory difficulties like speech defects, inattention and listlessness cause individual differences in learning.

Teachers must recognize that some of the individual differences arise because of basic physiological differences. They must recognize that these differences exist and demand that teachers should not force all children to learn at uniform rate.

When children begin to show indifference, failure, boredom inattention, tantrums, they indicate through these symptoms that teachers are expecting too much or too little from them. Pupils with sensory difficulties should be given differential treatment.

• **Check Your Progress**

1. Explain the Meaning of Individual Difference
2. Discuss the significance of individual difference in education.
3. Discuss the causes of individual difference.

2.7 LET US SUM UP

In this unit, we have studied the concept of human growth and development. The stages of development and the characteristics of each stage have also been discussed. The principles of development, their importance and need to study them scientifically have been discussed. Adolescence is a period of transition between childhood and adulthood. Accompanying it, are a number of problems. During this period, adolescents are considered neither as children nor as adults. Their status remains ambiguous. They are prone to rebel against authority. What can a teacher do to attend to these problems? How can they help the development of a balanced personality of students etc. have been dealt with to create a better understanding of students needs and problems.

2.8 UNITS END EXERCISES:

1. Trace those events from your own childhood and adolescence stages that reflect the characteristics of these periods.
2. "Adolescence is a period of storm and stress". Discuss with convincing arguments.
3. How can a teacher help adolescents develop a balanced personality? Discuss your experiences in this regard.
4. Describe the physical, emotional and social developmental characteristics of early and late childhood.
5. Explain the meaning and significance of individual differences
6. Discuss the meaning and causes of individual differences

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A) LEARNING
B) THEORIES OF LEARNING
C) TRANSFER OF TRAINING

Unit Structure

3.0 Learning Objectives

A) Learning

3.1 Introduction

3.2 Concept of learning (Meaning, Definition, Nature)

- Check your Progress

3.3 Characteristics of learning

- Check your Progress

3.4 Process of learning

3.5 Learning curve

- Check your Progress

B) Theories of Learning

3.6 Learning Theories

- Check your Progress

3.7 E.L Thorndike's Trial and Error Theory of Learning

- Check your Progress

3.8 Pavlov's Classical Conditioning Theory of Learning

- Check your Progress

C) Transfer of Training

3.9 Transfer of Training

- Check your Progress

3.10 Let us sum up

3.11 Unit End Exercise

3.12 Suggested Reading

3.0 OBJECTIVES

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

- Explain the concept of learning.
- Explain the Characteristics of learning
- Explain the steps involved in the process of learning.
- Tell the meaning & importance of learning curve.
- Explain the different types of learning curve.
- Describe the different stages of learning curve.
- Describe E.L Thorndike's Trial and Error Theory of Learning
- Describe Pavlov's Classical Conditioning Theory of Learning
- Explain the concept and types of transfer of learning
- Explain the educational implications of transfer of learning

3.1 INTRODUCTION

What does the word "learning" bring to your mind? learning to read, to ride a bicycle, to act, to use a computer, to play the guitar etc. Each one of us learns something or the other intentionally or accidentally. Learning situations are most natural and common in our life. Every moment you learn something or the other because of the varied experience you have in life. In the educational process, the central idea is learning.

A child learns right from his birth and goes on learning throughout his lifetime. An infant is quite helpless at birth, but slowly he learns to adopt himself to the environment around him.

e.g. A child approaches a burning matchstick; the child burns his hand and withdraws. Another time when he comes to a burning matchstick, he takes no time to withdraw himself away. He learns to avoid not only the burning matchstick but also all burning things. When this happens, the child has learnt that if one touches a flame, one gets burnt. In this way, the change in the behaviour of an individual occurs through direct or indirect experiences. This change in behaviour brought about by experience is called as learning. This is a very simple explanation of the term learning. Now let us understand the meaning and definitions of learning.

3.2 CONCEPT OF LEARNING

Meaning and Definitions of learning

Learning, in psychology, the process by which a relatively lasting change in potential behaviour occurs because of practice or experience. Learning is also a process of acquiring modifications in

existing knowledge, skills, habits, or tendencies through experience, practice, or exercise.

Gates and others “Learning is the modification of behaviour through experience”

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

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

Skinner “Learning is the process of progressive behaviour adaptation.”

Munn “To learn is to modify behaviour and experience.”

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

The above definitions emphasize four attributes of learning...

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

Nature of Learning:

a. Learning is adaptation or adjustment: All persons continuously interact with their environment. We often make adjustment and adapt to our social environment. Through a process of continuous learning, the individual prepares himself for necessary adjustment or adaptation. That is why learning is also described as a process of progressive adjustment to ever changing conditions, which one encounters.

b. Learning is improvement: Learning is often considered as a process of improvement with practice or training. We learn many things, which help us to improve our performance.

c. Learning is organizing experience: Learning is not mere addition of knowledge. It is the reorganization of experience.

d. Learning brings behavioural changes: Whatever the direction of the changes may be, learning brings progressive changes in the behaviour of an individual. That is why he is able to adjust to changing situations.

e. Learning is active: Learning does not take place without a purpose and self-activity. In any teaching learning process, the activity of the learner counts more than the activity of a teacher.

f. Learning is goal directed: When the aim and purpose of learning is clear, an individual learns immediately. It is the purpose or goal, which determines what, the learner sees in the learning situations and how he acts. If there is no purpose or goal, learning can hardly be seen.

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

• **Check your progress**

1. Define learning
2. What do you mean by learning?
3. Explain the nature of learning

3.3 CHARACTERISTICS OF LEARNING

Yoakum & Simpson have stated the following general characteristics of learning: Learning is growth, adjustment, organisation of experience, purposeful, both individual and social product of the environment.

According to W.R McLaw learning has the following characteristics.

1. Learning is a continuous modification of behaviour which continues throughout life

2. Learning is pervasive. It reaches into all aspects of human life.
3. Learning involves the whole person, socially, emotionally & intellectually.
4. Learning is often a change in the organisation of behaviour.
5. Learning is development. Time is one of its dimensions.
6. Learning is responsive to incentives. In most cases positive incentives such as rewards are most effective than negative incentives such as punishments.
7. Learning is always concerned with goals. These goals can be expressed in terms of observable behaviour.
8. Interest & learning are positively related. The individual learns best those things, which he is interested in learning. Most boys find learning to play football easier than learning to add fractions.
9. Learning depends on maturation and motivation.

3.4 PROCESS OF LEARNING

Learning is a process. It is carried out through steps. Learning process involves –

- (a) A motive or a drive.
- (b) An attractive goal.
- (c) A block to the attainment of the goal.

Let us see the steps one by one –

(a) A motive or a drive: Motive is the dynamic force that energizes behaviour and compels an individual to act. We do any activity because of our motives or our needs. When our need is strong, enough we are compelled to strive for its satisfaction. Learning takes place because of a response to some stimulation. As long as our present behaviour, knowledge, skill and performance are adequate to satisfy all our needs, we do not feel any necessity to change our behaviour or acquire new knowledge and skills. It is this requirement, which initiates a learner to learn something.

(b) Goal: Every individual has to set a definite goal for achievement. We should always have a definite goal for achieving anything. If a definite goal is set then learning becomes purposeful and interesting.

(c) Obstacle /block /barrier: The obstacle or block or the barrier is equally important in the process of learning. The obstacle or the barriers keep us away from attaining the goal.

Now, how can the obstacle be important in the process of learning? If one faces no difficulty of any kind in attaining the goal, he will not bring any change in his present behaviour or stock of knowledge or skills. Thus, the block or the barrier is an essential step in the learning process.

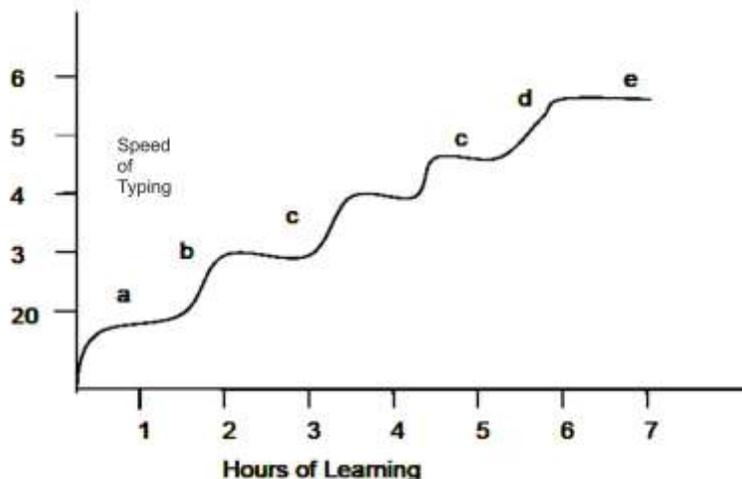
Consider an example. Suppose you wish to be included in your college hockey team. You want to have the esteem of your colleagues, your teachers. You are also motivated to try interesting experiences that you many enjoy. But you are blocked by your lack of skill in dodging, tackling and handling the ball. The obstacles in the path of goal achievement will set you make up your deficiency and acquire essential skill through sufficient practice and coaching.

Check Your Progress

1. Explain the process of learning
2. Explain the characteristics of learning.

3.5 LEARNING CURVE

Learning curve is a graphic representation of how learning takes place in a particular situation. In all types of learning situations, the course of learning can be depicted and described graphically by drawing learning curves against x and y axis.



The above figure shows a typical learning curve of many types of learning. The curve consists of a number of irregularities, as the progress is not constant.

For the convenience, the curve is divided into 5 stages – a, b, c, d and e.

(a) Period of slow progress: Generally, when a person has to start learning of a given activity from a scratch, his early progress will be slow. E.g., an infant's progress in learning to walk is very negligible in the beginning.

(b) Period of rapid progress: In this stage, the learner's output raises rapidly. e.g. In typing once the learner has developed co ordination of the movement of fingers, he shows rapid progress.

(c) Period of no apparent progress: Learning curves frequently display a period of no apparent progress. It is also known as **plateau**. A period of no visible learning progress, preceded and followed by improvement is called as plateaus. E.g. In typing, a person may after having made rather consistent progress for some time, reach a point where perhaps for weeks no further progress is made.

Causes of plateau

- (i) The learner may be reorganizing the previous learning into a new pattern before further progress is possible.
- (ii) The learner may have hit upon bad habits
- (iii) Lack of progress may be due to decrease in motivation.
- (iv) The task may not be of uniform difficulty.
- (v) Loss of interest.
- (vi) The onset of fatigue is also one of the causes of a plateau.

(d) Period of sudden rise: At the end of a plateau, there is generally a spurt in achievement. While on the plateau, the learner acquires better techniques, which help him later on to show rapid progress.

(e) Levelling: All learning will finally slow down to such an extent that it will ultimately reach a period of no improvement. No one can continue to improve indefinitely in any given situation. The learning curve will eventually reach a limit, where no further improvement is possible. This limit is known as physiological limit.

3.5.1 Characteristics of Learning Curve.

- (i) Slow initial progress.
- (ii) Spurt-like learning after some time.
- (iii) Declination in the rate of learning.
- (iv) Plateaus of learning.

- (v) Sudden increase in learning.
- (vi) Gradual levelling at the end.

3.5.2 Types of Learning Curve.

We get different types of learning curves depending upon –

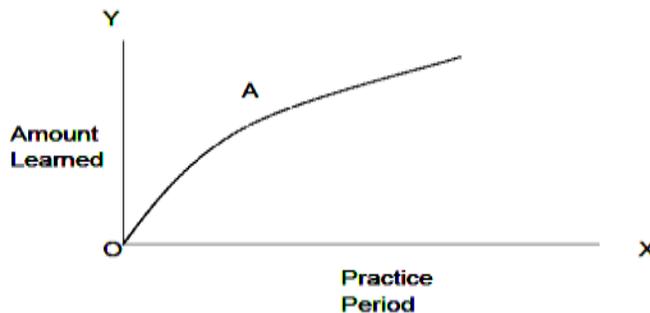
- (a) The nature of the learner
- (b) The nature of the task/learning material
- (c) Time available.
- (d) Conditions under which the learning takes place.

It is difficult to classify these learning curves. However, three common types of curves are there,

- (i) Negatively accelerated or the convex curve.
- (ii) Positively accelerated learning curve or the concave curve.
- (iii) Combination of convex-concave curve.

Convex curve

It depicts rapid initial improvement in learning that slows down with time. When the task is simple and the learner has previous practice on a similar task, we get this type of learning curve.



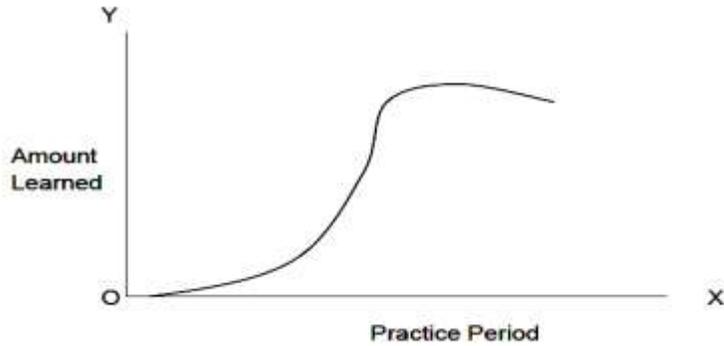
Concave curve

There is slow initial improvement and learning increases with time. When the task is difficult we get such type of learning curve.



Combination of convex concave curve

It looks like the capital letter 'S'. The curve takes concave or convex shape in the beginning depending upon the nature of the task.



In actual practical situations, such smooth curves are rarely found. Usually there are ups and downs (fluctuation).

3.5.3 Educational importance of learning curve

1. In acquiring the basic skills in various subjects, the learner at times appears to show no progress. At such moments, the teacher can diagnose the reasons for the lack of progress.
2. A student's progress may be arrested because the work is too complex for him. The teacher can observe the student's work and detect the part that gives him trouble. The teacher should see if the student has developed any faulty study habits, which impede his progress.
3. The plateau may be due to the lack of motivation. The teacher should provide encouragement in order to maintain motivation at a high level.
4. The learning curves give a graphic evidence of one's progress, which is an effective motivational device for the learner.
5. Occurrence of plateaus can be minimized by using superior teaching methods.

• Check your Progress

1. What is a learning curve?
2. Describe a typical learning curve.
3. What are the different types of learning curve?
4. State any two causes of plateau
5. Explain the educational importance of a learning curve.
6. State the important characteristics of a learning curve.

B) THEORIES OF LEARNING

3.6 LEARNING THEORIES

A **learning theory** is an attempt to describe how people and animals learn, thereby helping us understand the inherently complex process of learning. **Learning theories** have two chief values according to Hill (2002). One is in providing us with vocabulary and a conceptual framework for interpreting the examples of learning that we observe. The other is in suggesting where to look for solutions to practical problems. The theories do not give us solutions, but they do direct our attention to those variables that are crucial in finding solutions.

The three main categories or philosophical frameworks under which learning theories fall are behavioural, cognitive, and constructivism. Behaviourism focuses only on the objectively observable aspects of learning. Cognitive theories look beyond behaviour to explain brain-based learning. In addition, constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts.

We will discuss the behavioural theories under two broad categories: S-R theories.

- S-R (Stimulus-Response) theory with reinforcement
 - E.L Thorndike's Trial and Error theory
- S-R (Stimulus-Response) theory without reinforcement
 - Pavlov's Classical Conditioning

3.7 S-R (STIMULUS-RESPONSE) THEORY WITH REINFORCEMENT

A) E.L Thorndike- Trial and Error Theory of Learning:

Edward Lee Thorndike (1874-1949) was the first American psychologist who put forward the Trial and Error Theory of learning. According to Thorndike, all learning takes place because of formation of bond or connection between stimulus and response. He further says that learning takes place through a process of approximation and correction. A person makes a number of trials, some responses do not give satisfaction to the individual but he goes on making further trials until he gets satisfactory responses. Thorndike conducted a number of experiments on animals to explain the process of learning. His most widely quoted experiment is with a cat placed in a puzzle box.



Thorndike put a hungry cat in a puzzle box. The box had one door, which could be opened by manipulating a latch of the door. A fish was placed outside the box. The cat being hungry had the motivation of eating fish outside the box. However, the obstacle was the latch on the door. The cat made random movements inside the box indicating trial and error type of behaviour biting at the box, scratching the box, walking around, pulling and jumping etc. to come out to get the food. Now in the course of her movements, the latch was manipulated accidentally and the cat came out to get the food. Over a series of successive trials, the cat took shorter and shorter time, committed less number of errors, and was in a position to manipulate the latch as soon as it was put in the box and learnt the art of opening the door.

Thorndike concluded that it was only after many random trials that the cat was able to hit upon the solutions. He named it as Trial and Error Learning. An analysis of the learning behaviour of the cat in the box shows that besides trial and error, the principles of goal, motivation, explanation and reinforcement are involved in the process of learning by Trial and Error.

- **Laws of Learning**

Based on Trial and Error Learning Theory, Thorndike gave certain laws of Learning. We shall discuss three fundamental Laws of Learning in this section. These laws are:

- 1. Law of Readiness**

This law refers to the fact that learning takes place only when the learner is prepared to learn. No amount of efforts can make the child learn if the child is not ready to learn. The dictum that 'you can lead a horse to the pond but you can't make it drink water unless it feels thirsty' goes very well with this law. In other words, if the child is ready to learn, he/she learns more quickly, effectively and with greater satisfaction than if he/she is not ready to learn. In the words of Thorndike the three stages of this Law of Readiness are :

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

Thus, the Law of Readiness means mental preparation for action. It is not to force the child to learn if he is not ready. Learning failures are the result of forcing the learner to learn when he is not ready to learn something.

Educational Implications of Law of Readiness:

The law draws the attention of the teacher to the motivation of the child. The teacher must consider the psycho-biological readiness of students to ensure successful learning experiences. Curriculum / Learning experiences should be according to the mental level of maturity of the child. If this is not so, there will be poor comprehension and readiness may vanish.

2. Law of Exercise

This law explains the role of practice in learning. According to this law, learning becomes efficient through practice or exercise. The dictum 'Practice makes a man perfect' goes very well with this law. This law is further split into two parts — Law of use and Law of disuse. The law of use means that a connection between a stimulus and response is strengthened by its occurrence, its exercise or its use. In other words, the use of any response strengthens it, and makes it more prompt, easy and certain. Regarding the law of disuse, it is said that when a modifiable connection is not made between a stimulus and a response over a length of time, the strength of that connection is decreased. This means that any act that is not practiced for some time gradually decays. Anything that is not used exercised or practiced for a certain period tends to be forgotten or becomes weak in strength, efficiency and promptness.

Educational Implications

Exercise occupies an important place in learning. The Teacher must repeat, give sufficient drill in some subjects like mathematics, drawing, music or vocabulary for fixing material in the minds of the students. Thorndike later revised this law of exercise and accordingly it is accepted that practice does bring improvement in learning but it in itself is not sufficient.

Always practice must be followed by some reward or satisfaction to the learner. The learner must be motivated to learn.

3. Law of Effect

This is most important of Thorndike's laws, which state that when a connection between stimulus and response is accompanied by satisfying state, its strength is increased. On the other hand, when a connection is accompanied by an annoying state of affairs, its strength is reduced or weakened. The saying 'nothing succeeds like success' goes very well with this law. In other words, the responses that produce satisfaction or comfort for the learner are strengthened and responses that produce annoyance or discomfort for the learner are weakened. Thorndike revised this law in 1930 and according to this revision, he stated that reward strengthened the response but punishment did not always weaken the response. Then he placed more emphasis on the reward aspect than on the punishment aspect of Law of Effect.

Educational Implications

This law signifies the use of reinforcement or feedback in learning. This implies that learning trials must be associated with satisfying consequences. The teacher can use rewards to strengthen certain responses and punishment to weaken others. However, the use of reward is more desirable than the use of punishment in school learning. The teacher for motivating the students for learning situations can exploit the use of reward.

Check Your Progress

1. Define Learning. Describe Trial & Error theory of learning.
2. Explain the Laws of learning given by Thorndike.

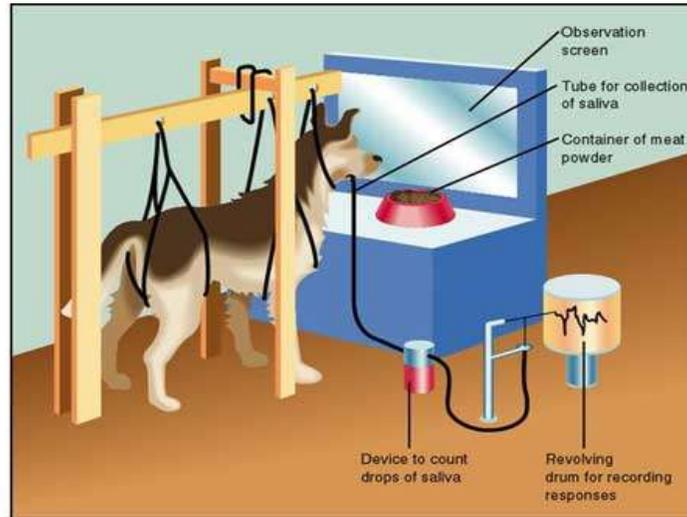
3.8 S-R (STIMULUS-RESPONSE) THEORY WITHOUT REINFORCEMENT

- **PAVLOV's CLASSICAL CONDITIONING (1849-1936)**

Classical conditioning is a term used to describe learning which has been acquired through experience. One of the best-known examples of classical conditioning can be found with the Russian psychologist Ivan Pavlov and his experiments on dogs.

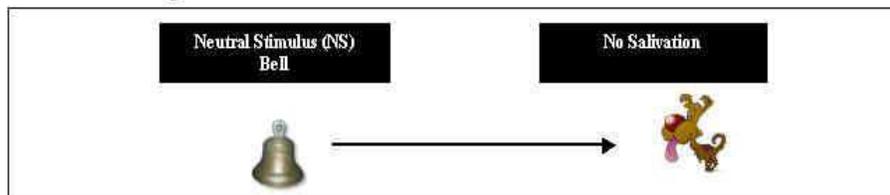
In these experiments, Pavlov trained his dogs to salivate when they heard a bell ring. In order to do this he first showed them food, the sight of which caused them to salivate.

Later Pavlov would ring a bell every time he would bring the food out, until eventually, he could get the dogs to salivate just by ringing the bell and without giving the dogs any food.

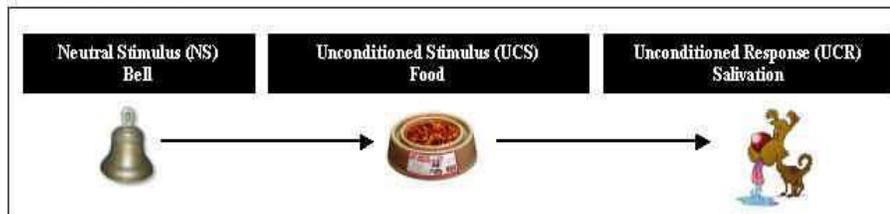


In this simple but ingenious experiment, Pavlov showed how a reflex (salivation, a natural bodily response) could become conditioned (modified) to an external stimulus (the bell) thereby creating a conditioned reflex/response.

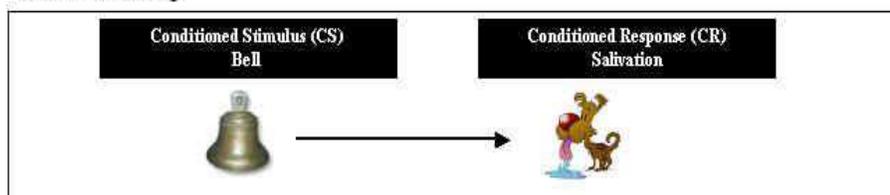
Before Conditioning



During Conditioning



After Conditioning



Components Involved In Classical Conditioning

We can gain a better understanding of classical conditioning by looking at the various components involved in his experiment;

- The unconditioned stimulus.(UCS)
- The conditioned stimulus.(CS)
- The unconditioned reflex/response.(UCR)
- The conditioned reflex/response. (CR)

So let's look at each of these classical conditioning components in more detail now.

Note: In its strictest definition classical conditioning is described as a previously neutral stimulus which causes a reflex (stimulus means something which causes a physical response).

The Unconditioned Stimulus (food): (UCS) An unconditioned stimulus is anything, which can evoke a response without prior learning or conditioning.

For example, when a dog eats some food it causes his mouth to salivate. Therefore the food is an unconditioned stimulus, because it causes a reflex response (salivation) automatically and without the dog having to learn how to salivate.

Unconditioned Stimulus – This causes an automatic reflex response.

Conditioned Stimulus (bell): (CS) The conditioned stimulus is created by learning, and therefore does not create a response without prior conditioning.

For example, when Pavlov rang a bell and caused the dogs to salivate, this was a conditioned stimulus because the dogs learnt to associate the bell with food. If they had not learnt to associate the bell with food, they would not have salivated when the bell was rung.

Conditioned Stimulus – You need to learn first before it creates a response. It is an acquired power to change something.

Unconditioned Reflex/Response (salivation): (UCR) An unconditioned reflex is anything that happens automatically without you having to think about it, such as your mouth salivating when you eat. Unconditioned Reflex – Reflex that happens automatically and you did not have to learn how to do it.

Conditioned Reflex (salivation in response to bell): (CR) A conditioned reflex is a response which you have learnt to associate with something.

For example, the dogs salivated when Pavlov rang a bell, when previously (without conditioning) the bell would not cause the dogs to salivate.

Conditioned Reflex – A reflex that can be evoked in response to a conditioned stimulus (a previously neutral stimulus).

- **Basic concepts in classical conditioning:**

There are several principles that are associated with classical conditioning, some of these are:

- **Extinction:** a conditioned response will disappear over time when the conditioned stimulus is no longer presented.
- **Spontaneous recovery:** sometimes there is the weak appearance of a previously extinguished response.
- **Stimulus generalization:** This is when individuals respond in the same way to experienced stimuli. For example, all fuzzy animals scaring a young child instead of just a fuzzy cat.
- **Stimulus discrimination:** Organisms can learn to discriminate between various stimuli.
- **Higher order conditioning:** This is when a neutral stimulus can cause the conditioned response sense if it had been associated with the conditioned stimulus.

Implications of Pavlov's Theory to Classroom Situations

1. The theory believed that one must be able to practice and master a task effectively before embarking on another one. This means that a student needs to be able to respond to a particular stimulus (information) before he/she can be associated with a new one.
2. Teachers should know how to motivate their students to learn. They should be versatile with various strategies that can enhance effective participation of the students in the teaching-learning activities.
3. Most of the emotional responses can be learned through classical conditioning. A negative or positive response comes through the stimulus being paired with. For example, providing the necessary school material for primary school pupils will develop good feelings about school and learning in them, while, punishment will discourage them from attending the school.

Conclusion

Learners and teachers have greatly benefited from all the theories. The teachers should be familiar with this theory and apply it to teaching-learning activities where applicable.

Check Your Progress

- 1) Define Classical Conditioning Theory.
- 2) What is the meaning of Unconditioned Response in Pavlov's Theory?

C) TRANSFER OF TRAINING

3.9 TRANSFER OF TRAINING

Introduction

The ability of the individual to apply the previous experience on the new related experience is what we call transfer of learning. Unless students are able to transfer prior skills and knowledge on new ones, the continuity of learning will be difficult. This unit will explain how old learning can be transferred to a new one. You will know what the classroom teacher needs to do in order to facilitate transfer of experiences among his/her students.

Meaning & Definition

The essence of learning is that a previously learnt fact should be linked with a present experience. This is because human being must be dynamic and that the prior experience will make them to develop the new skills and knowledge. The influence that past experience has on the succeeding experience is called transfer of learning.

Cormier and Hagman, (1987) define transfer of learning as the application of skills and knowledge learned in one context being applied in another context.

Oladele (1998) defines transfer of learning as the effect of prior learning on the present. Learning is meaningful when the past learning smoothens the progress of something else. For example, if a learnt experience refuses to aid the new learning, the goal of training has seized to be accomplished. In the school, the teacher teaches some subjects in order that the experience gained in those subjects could be transferred into another.

Charham (1987) affirms that human and animal learning is normally affected by the past experience, and that the various subjects are included in the school curriculum because of their utility and wide application to real life situations. For instance, the teacher who has taught his/her students some skills in Mathematics would believe that such skills be transferred to related subjects like Physics or Accounting. If the students fail to apply these skills in their subsequent learning, it means that the students have not been successful in transferring the learning.

Types of Transfer of Learning

The above example gives us clues into the different types of transfer of learning that we have. These are explained below:

(a) Positive Transfer: This is a situation whereby a previously learnt fact or information aids in the understanding of a new task. Aside from aiding the learners in their subsequent learning, it also helps the learners to learn the new task effectively.

(b) Negative Transfer: This is a type of learning in which prior experience impacts negatively on the new one. In this case, the understanding of past skills inhibits the mastering of new ones. For example, if a student wrongly connects information, it can lead to negative transfer.

(c) Zero Transfer: This type of learning reveals no link between the previously learnt task and the recent one. The evidence of zero transfer is hardly seen, it reveals no clear positive or negative effect.

Theories of Transfer of Learning

a. Theory of Mental Faculties: This theory was propounded by the Greek Philosophers, notable among them was Aristotle. The basic tenet of the theory is that human mind is sub-divided into different powers of faculties like memory, judgment, reasoning or thinking. It is therefore believed that each of these faculties is reinforced and developed by continuous memorization of poetry/poem and similar works. This theory believes that exercises and regular practice will

strengthen the mental faculties. The theory therefore dismisses the concept of transfer of learning. To it, a well trained and disciplined mind is the ingredient needed for understanding of new information.

b. Theory of Identical Elements: The theory which was developed by Thorndike and Woodworth (American Psychologists). It indicates that it is possible for an individual to transfer the prior skills and knowledge to recent ones because both experiences are identical (share things in common). This theory suggests that a successful or effective learning will happen if there are connections or interrelatedness between the old and the new experiences. For example, it is expected that a student who has learnt about anatomical parts of human being in a Biology lesson, should be able to do well when he/she is asked to name anatomical parts of a goat during Agriculture lesson.

c. Theory of Generalization: This theory was advocated by the Psychologist, Charles Judd. The assumption of the theory is that general principles aid transfer of learning better than segregated facts. This theory believes in Gestalt, an assertion which views learning from a whole or complete form rather than in isolated form. For example, the theory of generalization indicates that a learnt experience should be useful in other day-to-day related activities.

Educational Implications of Transfer of Learning

1. The teacher should know that transfer of learning will not take place when both the old and new are unrelated. Hence, the teacher should endeavor to teach his/her subject-matter in a more meaningful and detailed way rather than by rote.
2. The teacher should provide the opportunity for his/her students to practice a subject-matter being discussed along with him/her. When the learners are allowed to take active part in teaching learning activities, they will be able to repeat the task at another time.
3. For a transfer of learning to take place, the teacher should always emphasize the relationship that exists between one subject-matter and another.
4. The teacher should endeavor to develop positive attitudes towards a learning task so that the students can be motivated to like the task rather avoiding it.
5. It is believed that what students see, touch, feel or manipulate will be better remembered than the one they are not familiar with. Hence, for a meaningful transfer of learning to take place, the teacher should incorporate exercises that task the various senses of learners in the learning process.

Check Your Progress

- 1) List six ways of enhancing transfer of learning
- 2) Why do you consider Transfer of Learning a very important aspect in teaching?
- 3) Write short notes on:
 - a) Positive Transfer
 - b) Negative Transfer
 - c) Zero Transfer

Conclusion

The relevance of transfer of learning has been stressed in this unit. It will help the teachers on the action programmes that can facilitate learning transfer.

3.10 LET US SUM UP

In this unit we learnt about

- The meaning and concept of learning. The motive behind this is to ensure the learners have foundation knowledge of educational psychology and learning before actually advancing in other concepts.
- This unit help us to understand characteristics, process of learning and Learning curve.
- Thorndike's theory emphasizes that the fundamental of learning is the association between sense impressions and impulses to action (stimuli and responses). The theory stresses readiness, exercises and effect as the conditions for learning.
- Classical conditioning theory was formulated by Ivan Pavlov and the basic tenet of the theory is that behaviour of an organism can be manipulated using some environmental factors. The key relevance of theory to the learning is: it emphasizes practice of one task before moving on to another and encourages the use of motivation for effective learning.

- In this unit, we learnt about meaning of transfer of learning, theories of transfer of learning and classroom implications of transfer of learning

3.11 UNIT END EXERCISES :

1. What is the relevance of Psychology to the learning process?
2. What is a learning curve? Describe a typical learning curve.
3. State any two causes of plateau.
4. Explain the educational importance of a learning curve. State the important characteristics of a learning curve.
5. Describe Thorndike's law of readiness, exercises and effect. State the importance of these laws
6. What do you understand by Classical Conditioning Theory?
7. What are the implications of Classical Conditioning on the students' learning?
8. Write short notes on the following:
 - a. Conditioned Stimulus
 - b. Conditioned Response
 - c. Unconditioned Response
9. What is transfer of learning?
10. Discuss the three theories of transfer of learning
11. What are the implications of transfer of learning on pedagogical activities?

3.12 SUGGESTED READING

- Chauhan. S. S. (2001) "Advanced Educational Psychology" Vikas publicity House Pvt.Ltd.
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FACTORS AFFECTING LEARNING

Unit Structure :

- 4.0 Learning Objectives
- 4.1 Introduction (Concept and Educational Implications)
- 4.2 A) Attention as a factor in Learning
 - Check Your Progress
- 4.3 B) Perception as a factor in Learning
 - Check Your Progress
- 4.4 C) Motivation as a factor in Learning
 - Check Your Progress
- 4.5 Let Us Sum Up
- 4.6 Unit End Exercise
- 4.7 Suggested Readings

4.0 OBJECTIVES

After going through this unit, you will be able to ...

- Explain the factors affecting learning
- Explain the concept and educational implication of attention as a factor affecting learning
- Explain the concept and educational implication of perception as a factor affecting learning
- Explain the concept, educational implication of motivation as a factor affecting learning

4.1 INTRODUCTION

Learning, can be considered as the process by which skills, attitudes, knowledge and concepts are acquired, understood, applied and extended. All human beings, engage in the process of learning, either consciously, sub-consciously or subliminally as grownups or children. It is through learning that their competence and ability to function in their environment get enhanced. It is important to understand that while we learn some ideas and concepts through instruction or teaching, we also learn through our feelings and experiences. Feelings and experiences are a tangible part of our lives and these greatly influence what we learn, how we learn and why we learn.

Learning has been considered partly a cognitive process and partly a social and affective one. It qualifies as a cognitive process because it involves the functions of attention, perception, reasoning, analysis, drawing of conclusions, making interpretations and giving meaning to the observed phenomena. All of these are mental processes, which relate to the intellectual functions of the individual. Learning is a social and affective process, as the societal and cultural context in which we function and the feelings and experiences which we have, greatly influence our ideas, concepts, images and understanding of the world. These constitute inner subjective interpretations and represent our own unique, personalized constructions of the specific universe of functioning.

Our knowledge, ideas, concepts, attitudes, beliefs and the skills, which we acquire, are a consequence of these combined processes. The process of learning involves cognition, feeling, experience and a context. Individuals vary greatly with regard to their ability, capacity and interest in learning. You must have noticed such variations among your friends and students. In any family, children of the same parents differ with respect to what they can learn and how well they can learn.

For example, a particular child may be very good at acquiring practical skills such as repairing electrical gadgets, shopping for the household etc., while his brother or sister may in contrast be very poor on these, and good at academic tasks, instead. Even for yourself, you may be perplexed why you can do some tasks well, but not others given the same competence level.

For example, learning the tunes of songs and even their lyrics is often found to be easier than learning a formula or a poem. Do you ever wonder why this is so? You may have observed that for some people, learning driving, swimming, or cooking is achieved easily, while for some others it is a nightmare. Why this happens, what could be the underlying reasons, why individuals differ with respect to how, and what they learn, are the key questions addressed in the present unit. To find some answers to these questions, we will **try** to identify and understand the various factors affecting learning.

4.2 ATTENTION AS A FACTOR IN LEARNING

One factor, which affects learning, is attention. Attention is always present in conscious life and is common to all types of mental activity. It is the characteristic of all conscious life. Every activity of yours is based on interest and attention. You can succeed in achieving your goals only when your attention is directed towards learning.

Attention is defined as the act of selective consciousness- by **Ross Dumville** defined Attention as the concentration of consciousness upon one subject rather than another.

Characteristics of Attention

- Attention is focusing consciousness on one object. One object is the focus of attention. All other objects are in the margin of attention. (Right now, what is the focus of your attention? what objects are in the margin of your attention?)
- Attention is selective. We choose to attend to one object in preference to others.
- Attention is constantly shifting from focus to margin
- Attention is a state of preparedness where the muscles and sense organs ready themselves for attending
- Attention cannot be divided between two mental tasks.

Types of Attention

- **Voluntary Attention:**

a person actively searches out information that has personal relevance

- **Selective Attention:**

a person selectively focuses attention on relevant information

- **Involuntary Attention:**

A person automatically focuses on some activity

- **e.g.:** A mother even while working, is aware of her infant child's crying & attends to the child.

Several factors affect attention. These are factors inherent in the object of attention

1. **Movement:** An animated picture elicits more attention than a still picture
2. **Size of an object:** Large letters attract more attention than tiny font.
3. **Contrast:** Dark letters stand out against a light background.
4. **Colour:** Colours, especially bright ones, gain more attention than drab colours
5. **Novelty:** A new gimmick in advertising is an instant hit
6. **Change in stimuli:** If the clock suddenly stops its ticking, it is likely to attract attention. If a teacher pauses in the midst of the lecture, the students are likely to pay more attention to the next few words

7. **Intensity:** A glaring light, sharp sound, fluorescent markers serve as attention grabbers.
8. **Repetition:** Words of a song that are repeated or words in a lecture that are repeated attract attention.

Significance of Attention

Attention is a basic need for all types of learning. Every moment, an individual is attracted by many stimuli of the environment. He is not able to concentrate on all the stimuli at the same time. It is because of attention that he can concentrate on important aspect of a single object.

Consider a classroom, where there are lot of things like, desk, bench, chalk, black board, duster, fan and charts. When a teacher shows you a particular chart, the student pays attention to that. It shifts the focus of learner to the chart. This helps them to learn more about it.

Therefore, it can be said that attention?

- Arouses interest in learners to learn a particular thing.
- Increases efficiency of the learner
- Motivates learners to learn more
- Make the learners ready to learn
- Brings a state of alertness in learners for doing task
- Helps the learner to perceive events or ideas.

Thus, attention is a necessary condition for any task in the classroom. It is the hub of the entire learning process. It is essential for learning as well as understanding well. Attention is an essential factor for teachers as well as students. If you are attentive in classroom, you are fully prepared to receive any stimulus. It enables you to learn properly within a period. It helps you to achieve the target within short period and with reasonable amount of effort.

• Check Your Progress

1. What do you mean by attention? State the characteristic of attention.
2. State two educational significance of attention

4.3 B) PERCEPTION AS A FACTOR IN LEARNING

PERCEPTION

Perception is the process through which a person is exposed to information, attends to the information, and comprehends the information.

Exposure: A person receives information through his/her senses

Attention: A person allocates processing capacity to a stimulus

Comprehension: A person interprets the information to obtain meaning from it

Meaning: Perception is the mental process by which you get knowledge of external world. You receive innumerable impression through the sense organs. You select some of these and organize them into unit, which convey some meaning. The transformation of sensation into organised pattern is called as perception.

Perception = Sensation + Meaning

For E.g. Eyes react to light and give us the knowledge of brightness, nose reacts to smell and give us the knowledge of pleasant or unpleasant smell, ear react to the sound of barking and gives us the knowledge of the presence of a dog.

Perception is an active state of mind in which it reacts to a sensation and interprets it. The basis of perception is sensation.

Importance of Perception in Learning

Learning depends on an individual's precepts. If you are able to perceive a thing correctly, then right learning will take place. Learning will proceed in a proper direction due to correct precepts. Both sensation and perception play an important role in you learning. Sensations are the first impression. So it has to be absolutely clear. Sensations give rise to perception and on that basis you get a proper understanding of an object, idea or an experience. Learning depends upon accurate and efficient perception and perception depends upon the sensation, which depends on the normal functioning of the sense organs. Thus perception is important for proper learning and understanding.

Check Your Progress

1. Explain, what do you mean by perception?
2. Discuss the importance of perception in classroom teaching and learning process.

4.4 C) MOTIVATION AS A FACTOR IN LEARNING

The knowledge of how to stimulate the students to participate meaningfully in classroom will go a long way in assisting the teachers. This unit therefore provides the learners the opportunity to understand different theories of motivation and how to apply these theories to their day-to-day classroom teaching/learning activities.

Motivation is defined as an inspiration that propels someone into an action. It is an internal state or condition that activates and gives direction to our thoughts, feelings, and actions (Lahey, 1995). In the opinion of Oladele (1998), motivation is a process by which the learner's internal energies are directed toward various goal objects in his/her environment. These energies or arousals push an individual in achieving his goals. An individual may be highly motivated to perform well in a task and completely unmotivated in another. This means that when people are motivated, they will work tirelessly to achieve their aspirations.

Maslow (1970) believed that motivation leads to growth and development, and that need, satisfaction is the most important sole factor underlying motivation. Maslow further explained that man is perpetually in need and that the resources to satisfy those needs are limited. In view of this, man places his/her wants on the scale of preference, that he/she selects the most pressing need. After this need has been satisfied, it becomes less important, paving way for the next on the rank.

The needs of man may either be primary or secondary. Primary needs are the physiological wants of man. It may be the need for water, rest, sexual intercourse, hunger and thirst. Secondary needs are the desire for autonomy, affection, or the need for safety and security. For example, the desire of a labourer to take a glass of water after thirst is a primary need. At the same time, craving of the students to stay in a serene classroom environment is a secondary need.

Types of Motivation

There are two types of motivation or arousals. They can either be internally or externally driven. The desire for food or sex arises from within us (intrinsic), while the yearning to obtain recognition or approval is influenced by the conditions in our environment (extrinsic). In view of the above explanation, motivation is divided into intrinsic and extrinsic.

1. Intrinsic Motivation: Is an internal force or motive within the individual which propels him/her into emitting certain behaviour. It is

an innate or genetically predetermined disposition to behave in a particular way when he/she faces a particular situation. This type of motivation can make an individual to have the feelings of self-confidence and competence (Deci and Ryan, 1985). A student who is intrinsically motivated may carry out a task because of the enjoyment he/she derives from such a task. In another way, a dog that sees a bone and runs for it, did that because of the satisfaction it derives from eating bone. This type of behaviour does not require any prior learning. Sighting the bone changes the behaviour of the dog and propels it to act.

2. Extrinsic Motivation: Is the external or environmental factor, which sets the individual's behaviour into motion. The incentive/reinforcer drives an individual's behaviour towards a goal. A student who is extrinsically motivated, will execute an action in order to obtain some reward or avoid some sanctions. For example, a student who studied hard for the examination did so because of the desire to obtain better grade. The case also goes for a runner who wants to win a prize, he/she will need constant practice than a person who wants to run for the fun of it. Extrinsic rewards should be used with caution because they have the potential for decreasing intrinsic motivation.

For example extrinsic incentive may spur a student to actively participate in the task for which the student has no interest, but may undermine intrinsic and continuing motivation in him/her (Deci et al, 1985). Therefore, students' motivation automatically has to do with the students' desire to participate in the learning process. It also concerns the reasons or goals that underlie their involvement or non-involvement in academic activities.

Theories of Motivation

Different psychologists have developed several theories on motivation. Notable among them are as follows

Maslow's Theory of Motivation

Abraham Maslow was a foremost Psychologist. He developed a theory (Human Needs) in which he identified seven vital human needs according to level of urgency or exigency. These needs according to the Maslow are:

1. Physiological Needs: These are the biological or survival needs of man. They are the most basic needs that control the other needs. Until these needs are fulfilled or satisfied, man will not be able to go to the next level. Examples of these needs are the desire to eat food when hungry, drink water when thirsty or the need for rest, sex, air or to excrete unwanted materials from the body systems. After these survival needs have been adequately taken care, they become less important and one moves to the next which is the desire for security and safety.

2. Safety and Security Needs: Human beings require safety and protection from danger or external aggressors. After one has successfully dealt with physiological needs, it is desirable to cater for psychological needs. At this point, Man will be thinking of where to live and efforts will be made to keep him/herself from impending dangers, threats or hazards. The hallmark of these needs is the quest by an individual to seek for conducive or peaceful abode. For example, the desire of war victims to migrate from their original country to become refugees in another country is the need for safety and security. Also, a chicken that quickly hibernates under its mother on sighting an eagle did so because of its desire for safety.

3. Love and Belongingness Needs: This involves the aspiration of man to establish a cordial relationship with others. It is the need of man to love and be loved. At this level of need, people will like to extend their hands of fellowship or comradeship to their friends, mates, co-workers or neighbours. They equally will expect that such gestures be reciprocated by others. Onyehalu (1988) believes that this need is manifested in our affiliations and friendships.

4. Achievement Needs: Achievement needs are divided into two. These are the need to achieve success and the need to avoid failure or setback. The need to attain success or freedom drives man to go extra miles. This need motivates an individual to emit a behaviour that will make him/her command respect from others.

5. Self-Esteem Needs: These are the things we desire in order that our ego will be boosted. After the individual has been accorded respect or recognition by others, the next thing for him/her is to start seeking for the things that will make him/her enjoy considerable influence from others. The ability of someone to fulfil this condition makes him/her feel superior and self-confident. Inability to fulfil this need, makes a person feel dejected or inferior.

6. Aesthetic Needs: These needs include the desire of people to pursue or admire beautiful things; their desire for beautiful and expensive cars, houses, materials, gorgeous and expensive dresses and beautiful surroundings with well trimmed and maintained flowers.

7. Self-Actualization Needs: When a person has successfully achieved or gained the most basic needs or wants, then such an individual will want to get a rare opportunity. It is the time when a person will like to distinguish him/herself, by seeking for power or extra-ordinary achievement. At this point, the person is said to have reached the peak of his potentials.

Classroom Implications of Theory of Motivation

- It is important for the teacher to know the basic needs of his/her students and cater for these according to level of their

important. For example, the teacher needs to think first of students' food, rest or health before thinking of teaching them.

- When the teacher praises his/her students for doing well in their study or assignment, they will be spurred to sustain that effort.
- A classroom, which is well decorated or adorned with beautiful charts, and learning materials will be students' friendly. The students' minds will always be attracted to the activities in a beautifully adorned classroom.
- In the classroom, students like being recognized or respected. When their views are recognized or respected, they will have their confidence boosted and developed.
- From the beginning of the lesson, the teacher should endeavour to make his/her students know possible outcome of the lesson. It is when the students know what they are likely to achieve from the lesson that their attention will be arrested and sustained.
- Feedback is necessary if the interest of the students must be sustained in the classroom. So the teacher should always strive to let them know how they are performing in the teaching-learning activities.
- The teacher should also provide/plan for extra-curricular activities for his/her students. When the teacher does this, the students will have opportunity of establishing a genuine interaction among them. Besides, they will be able to display their hidden talents.
- When dealing with the students in the classroom, the teacher should take into consideration, the developmental changes and differences in the students before deciding on the particular motivation pattern to be employed.

Check Your Progress

- 1) What problems are associated with the use of extrinsic reward?
- 2) How does learning objectives affect student motivation?
- 3) How can you promote intrinsic motivation in students?
- 4) Write short notes on the following:
 - a) Physiological Needs
 - b) Aesthetic Needs

4.5 LETS SUM UP

This unit has prepared the teachers to focus on the factors that affect the learning process.

- We discussed how attention contributes to learning
- The various strategies teachers can employ to keep the attention and give clear perception of the students in the teaching-learning activities.
- We discussed the Definitions, Types and Theories of motivation which has given an understanding how to motivate the student in classroom.

4.6 UNIT END EXERCISES:

- 1) Discuss the concept of attention as a factor affecting learning along with its educational implications..
- 2) Discuss the significance of perception to learning
- 3) Define motivation. Differentiate between intrinsic and extrinsic motivation
- 4) What is the relevance of motivation to students learning?

4.7 SUGGESTED READINGS

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MENTAL PROCESSES RELATED TO LEARNING

Unit structure:

5.0 Objectives

5.1 Introduction

5.2 A) Thinking- Concept, Types of Thinking- Divergent, Convergent, Critical, Reflective, Lateral.

- Check Your Progress

5.3 B) Memory- Concept, Types, Factors affecting memory

- Check Your Progress

5.4 C) Forgetting- Concept, Types, Causes, Educational Implications

- Check Your Progress

5.5 Lets Sum Up

5.6 Unit End Exercises

5.7 Suggested Readings

5.0 OBJECTIVES

After going through this unit, you will able to

- To develop an understanding of the mental processes related to learning.
- To develop an understanding of the nature and concept of thinking.
- To acquaint the learners with the different types of thinking.
- To gain an insight into the mental processes involving memory, forgetting, imagination and reasoning.
- To define forgetting and understand the nature of forgetting
- Explain the causes of forgetting
- Describe the educational implications of forgetting

5.1 INTRODUCTION

Psychology deals with the study of the mental processes which include how people think, perceive, remember and learn. Thus, it is concerned with internal processes such as thinking,

memory, imagination, reasoning etc. Thought or capacity to think was at one time held to be not only the most distinctive characteristic of human nature but also the one which most clearly distinguished the human being from other creatures.

The great philosopher Descartes had said, “I think, so I exist”, implying that thought is the very essence of human existence. Thinking, therefore, represents the most complex psychological processes. Most of the things in the world produced by man are products of his thinking and reasoning abilities. Even to understand, appreciate or use the things developed by man, one has to employ the powers of thinking and reasoning. Thus, powers of thinking and reasoning may be considered to be essential tools for the welfare and meaningful existence of the individual as well as the society.

Learning not only involves thinking processes but also retaining or storing the acquired material and retrieving and remembering the related material. It is a known fact that we neither retain nor remember everything that has been learnt or experienced. This phenomenon of losing is evidenced by our inability to remember what we have learnt and is known as forgetting.

Thus, in this unit we will try to learn something about thinking, reasoning, memory and forgetting, which are integral parts of human behavior.

5.2 THINKING

Concept of Thinking:

Thinking is a complex process which involves manipulation of information as we form concepts. It also engages in problem solving, reasoning and making decisions. Thinking is a higher cognitive function and the analysis of thinking processes is part of cognitive psychology. Thinking is 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.

Definitions:

Ross: Thinking is a mental activity in its cognitive aspect.

Kolesnik: Thinking is the reorganization of concepts.

Woodworth: Thinking is mental exploration to find out solution to a problem.

Characteristics:

- It is one of the most important aspects of ones cognitive behavior.
- It depends on both – perception and memory.
- Thinking is a mental process which starts with a problem and concludes with its solution.
- It involves trial and error; analysis and synthesis; foresight and hindsight.
- It is a symbolic behavior.
- It is a cognitive activity.
- It is always directed to achieve some purpose.
- It is different from day-dreaming and imagination.
- It is a problem-solving behavior.
- There is mental exploration instead of motor exploration..

(e.g.: if a person gets locked in a room and loses his keys and he starts searching for them in different places. This becomes motor exploration. But if he tries to think of different ways of how he can get out of the room then this becomes mental exploration- THINKING.)

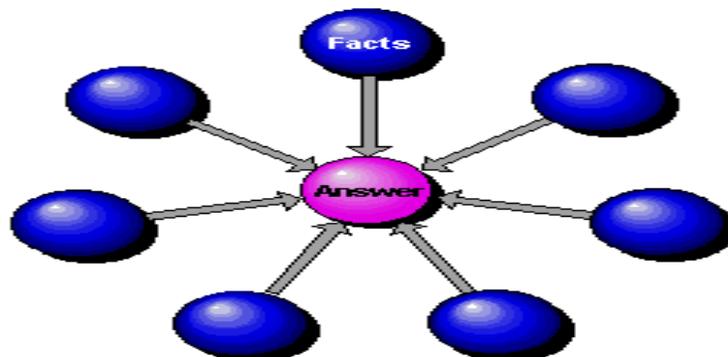
- Thinking is a symbolic activity. (e.g.: engineers use mental images and symbols to design the plan for buildings)

TYPES OF THINKING

- Convergent Thinking
- Divergent Thinking
- Critical Thinking
- Reflective Thinking
- Lateral Thinking

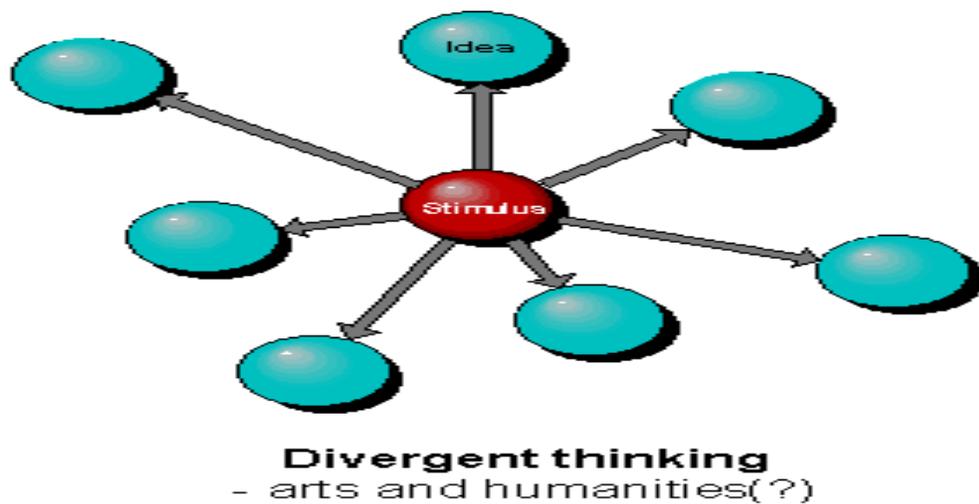
a) Convergent Thinking

Convergent thinking
- science and technology(?)



Convergent thinking proceeds on the assumption that there is one single best solution to any problem, and also that the solution can be arrived at on the basis of the existing knowledge. Thus, convergent thinking involves the direction of all thought process in one single direction. "Convergent" thinking is that in which the person is good at bringing material from a variety of sources to bear on a problem, in such a way as to produce the 'correct answer'. Because of the need for consistency and reliability, this is really the only form of thinking which standardized intelligence tests (and even National Exams) can test.

b) Divergent Thinking



"Divergent" thinking may start from existing knowledge, but it proceeds in different directions and is not limited or bound by existing knowledge. At times, the divergent thinker may question and doubt the adequacy of the existing knowledge. This type of thinking may start from a common point and move outward into a variety of perspectives. When fostering divergent thinking, teachers use the content as a vehicle to prompt diverse or unique thinking among students rather than a common view. Divergent thinking is also creative thinking. It generates something new or different. It involves having a different idea that works as well or better than previous ideas. Thus, divergent thinkers have an open mind. He is not controlled by the belief that there is "one best solution" to any problem or "the correct answer" to any question.

Basically divergent thinking is a mode in which a person or group makes themselves open to new ideas. Generally speaking, they are working with, what we might call, an open ended problem, a problem for which there is, there may be, many creative possible solutions. So the divergent thinking process is one in which we are open to all those ideas and we generate lots of new ideas. The difference between the two can be seen in the following table:

Convergent Thinking	Divergent Thinking
Non creative people have convergent thinking.	Creative people have divergent thinking.
Produces single correct answer.	Produces variety of responses.
It is stimulus bound.	It is stimulus free.
The problem is solved by known or common method.	The problem is solved by different innovative methods.
It is rigid, stereotyped & mechanically operated.	It is novel, exploratory & venturesome.
It is measured by intelligence test which includes remembering, recognition & manipulation of some concrete material.	It is measured by creativity tests in which novelty, flexibility & originality are given more weightage.
It is known as Reasoning or Rational Thinking.	It is known as Creative Thinking, Imaginative or Original Thinking.

c) **Critical thinking**

Critical thinking assesses the worth and validity of something existent. It involves precise, persistent, objective analysis. When teachers try to get several learners to think convergently, they try to help them develop common understanding. According to **Norris, Stephen P**: "Critical thinking is deciding rationally what to or what not to believe."

According to Moore and Parker, Critical Thinking is "the careful, deliberate determination of whether we should accept, reject, or suspend judgment about a claim, and the degree of confidence with which we accept or reject it.

"Broadly speaking, critical thinking is concerned with reason, intellectual honesty, and open-mindedness, as opposed to emotionalism, intellectual laziness, and closed-mindedness."

Attributes of a critical thinker:

- ✓ asks pertinent questions
- ✓ assesses statements and arguments
- ✓ is able to admit a lack of understanding or information
- ✓ has a sense of curiosity
- ✓ is interested in finding new solutions
- ✓ is able to clearly define a set of criteria for analyzing ideas

- ✓ is willing to examine beliefs, assumptions, and opinions and weigh them against facts
- ✓ listens carefully to others and is able to give feedback
- ✓ sees that critical thinking is a lifelong process of self-assessment
- ✓ suspends judgment until all facts have been gathered and considered
- ✓ looks for evidence to support assumption and beliefs
- ✓ is able to adjust opinions when new facts are found
- ✓ looks for proofs
- ✓ examines problems closely
- ✓ Is able to reject information that is incorrect or irrelevant.

d) **Reflective thinking**

Dewey's definition of reflective thinking:

"Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends"

Reflective thinking is normally a slow process. It takes considerable time to work on inferring and combining by reflecting upon what we have learnt:

This is a higher form of thinking.

- It aims at solving complex problems.
- It requires reorganization of all the relevant experiences and the finding of new ways of reacting to a situation or of removing an obstacle instead of a simple association of experiences or ideas.
- There is insightful cognitive approach in reflective thinking.
- It takes all the relevant facts arranged in a logical order into account in order to arrive at a solution of the problem in hand.
- It links the information we possess into tighter network, thus helps to remember the matter better.
- It criticizes what one has learned and tries to expose weaknesses and shortcomings.
- Enhancing decision making requires that we learn from our successes and failures and catalog mentally for future retrieval what has occurred and why.

e) Lateral thinking

Lateral thinking is a term coined by Edward de Bono, a Maltese psychologist, physician and writer. It first appeared in the title of his book, 'The Use of Lateral Thinking', published in 1967. De Bono defines lateral thinking as methods of thinking concerned with changing concepts and perception. Lateral thinking is about reasoning that is not immediately obvious and about ideas that may not be obtainable by using only traditional step-by-step logic.

De Bono identifies four critical factors associated with lateral thinking: (1) recognize dominant ideas that polarize perception of a problem, (2) searching for different ways of looking at things, (3) relaxation of rigid control of thinking, and (4) use of chance to encourage other ideas.

Lateral thinking involves discarding the obvious, leaving behind traditional modes of thought, and throwing away preconceptions.

- Explanation: A person would use lateral thinking when they want to move from one known idea to creating new ideas.
- Lateral thinking can be used to help in solving problems but can also be used for much more.
- With lateral thinking problems can be solved and questions can be answered, as lateral thinkers are able to use their creative skills to change perceptions and come up with new concepts and ideas.
- The lateral thinking technique of 'challenge' is designed to prevent the mind sliding smoothly down the existing patterns.
- Lateral Thinking is the ability to add a slight "twist" to the pattern of logical thinking to produce an unexpected answer!
- Essentially, lateral thinking is a way of attacking problems from other angles, as opposed to the more traditional linear and logical ways. De Bono uses the example of chess, where logic normally suffices, if the pieces are a given. Lateral thinking acknowledges that in real life we mostly just assume the pieces are given, when really we need to change those pieces or look beyond them for the most useful solutions.

Lateral Thinking helps individual to develop skills to:

- ✚ Increase productive idea output.
- ✚ Design the future.
- ✚ Find fresh new solutions to intractable problems.
- ✚ Escape the constraints of routine thinking.
- ✚ Appreciate the diversity of thinking among team members.

- ✚ Plan and lead innovation meetings that deliver powerful results.
- ✚ Find new areas of opportunity.

- **Check your Progress**

1. What do you understand by thinking?
2. Enumerate the characteristics of thinking.
3. Explain the concept of Thinking
4. Define Thinking; Explain the various types of thinking.

5.3 B) MEMORY- Concept, Types, Factors Affecting Memory

Concept

It is said that education is a life long process and we are learning all the time. But simply learning without being able to repeat that in another situation or occasion is of no use. Thus we must be able to make use of past experiences. We must be able to reproduce it. This power of reproduction is known as memory, or the ability to retain and recall the past events to present consciousness. This implies that memory is the reproduction of past experience even without the presence of the stimulus.

Guilford: “Memory is the retention or storage of information in any form”.

Woodworth & Marquis: “Memory consists in learning what was previously learned”.

Ryburn: “The power that we have to store our experience and to bring them back into the field of consciousness some time after the experience have occurred is termed as memory”.

F'iedsetal: “Memory is the ability to retain & reproduce impressions once perceived”

Memory is the special ability of our mind to store when we learn something, to recollect & reproduce it after some time. Memory is a complex process involving learning, retention, recall & recognition. The experiences, which we undergo, leave traces in

our minds in the form of 'Schemas'. The length of our retention depends on the strength & quality of the traces.

TYPES OF MEMORY:

1. **Immediate Memory:** This is also known as short term memory. This memory is when the individual has to reproduce immediately after he has learnt something, thus the time span is very less for the matter to be registered in the consciousness. Hence, the learnt matter is forgotten rapidly. e.g. we may first look at the seat number of our ticket & once we sit down we forget about it. In this type of memory, the retention time is very brief. Immediate memory is needed which helps us to learn a thing immediately with speed and accuracy, remember it for a short duration and forget it rapidly after use.
2. **Short-term memory:** This type of memory is also called as temporary memory. It is not short lived as the immediate memory. The information temporarily stored in short-term memory may last as long as thirty seconds even if the material is not being rehearsed. However, some people are able to retain a lot of information in short- term memories by a process called chunking, which groups information by coding it, e.g. the number 143254376 can be remembered by listing under three heads: 143, 254, 376 for better remembering.
3. **Long term memory:** This is also known as Permanent Memory. Here the individual learns and retains the information for a very long period of time. There is an interval of time between learning & recall or reproduction. Thus, permanent memory is involved in remembering the account number of the bank or the phone number etc.

Other types of Memory: Some of the important types of memory are as follows.

1. **Immediate memory:** Immediate memory is that which helps us to learn a thing immediately with speed and accuracy, remembering it for a short time and forgetting rapidly after use. e.g. seat number of cinema hall.
2. **Permanent memory:** Permanent memory helps us to remember a thing permanently. e.g. remembering our name.
3. **Rote memory:** Under rote memory, the things are learnt without understanding their meaning.
4. **Logical memory:** Logical memory is based on logical thinking. It takes into consideration purposeful and insightful learning.

5. Associated memory: The memory which helps to associate the previously learned things with so many related things and then establish multiple connections is known as associated memory.

6. Active memory: In active memory one has to remain active and make deliberate attempts for recollecting the past experience.

7. Passive memory: Here the past experiences are recalled spontaneously without any serious attempt

So we see that memory is a process involving learning & reproduction. The amount of material that can be immediately reproduced after one repetition is called **span of memory**. The phenomenon of memory may be studied under four different aspects: viz the four R's.

1. Registration or Learning
2. Retention
3. Recall
4. Recognition

1. REGISTRATION OR LEARNING: Before remembering, it must be registered or learnt. Learning requires time. It has economical use of time in learning. The most efficient methods of learning or memorizing that would yield the best results from the point of view of remembering effectively for a long time are as follows:

A. Rote Memorization: This is learning without understanding. Yet meaningful material is easily learnt than non-sense material. It is easier to learn poetry than prose; prose is easier to learn than disconnected words. Disconnected words are easier to learn than nonsense words. Thus logical sequence is important, along with the systematic arrangement of ideas. However, mechanical learning must be avoided as it is less effective.

B. Spaced V/S Mass Learning: In spaced learning, the learner has been allowed some rest in memorization. The subject is not required to memorize the assignment in one continuous time period. Intervals are provided. The Principle of 'work & rest' is followed. In mass learning, the subject has to memorize the assigned material at one sitting without any interval or rest, until it is mastered. Shorter study periods are better for young pupils & slow learners. Spaced learning benefits pupils of lower classes, when motivation level is low or material is complex & difficult to understand. It is better to introduce periods of rest while studying. This helps in removing the monotony of long periods of study. Attention also does not flag and fatigue is avoided. Mass learning is effective when the pupils are very

intelligent or are highly motivated. Although, both the methods of learning are found to be useful and effective in one situation or the other, success in the use of a particular method depends more on the abilities of the individual and the nature and range of the material to be memorized than on the method itself.

C. Whole verses Part method of learning: Let's take the example of a poem, when the poem is read again & again from start to finish; this is whole method of learning. This method can be adopted when the material is not very lengthy & when the material is logically arranged. Less time is used compared to part method. Here again the poem for example is broken down to parts or stanzas & then learnt, thus slow learners & average students are benefitted. The learner is motivated each time he masters the parts. Thus the whole content is slowly mastered. Even when the material is large & is not well organized, this method can be used.

D. Recitation: The best method of learning is when by the student reads the lesson few times & then reviews the lesson without the book i.e. he recites the material learnt to him. Studies have shown that self recitation is better & time saving than just reading & re-reading because permanent retention is achieved. Learner is able to detect his weakness & rectify them. Thus he knows his progress as well.

E. Mnemonic Devices: Grouping always helps to memorize easily, thus we learn poetry easily compared to prose, but many material come without such natural grouping. Thus artificial associations are made to associate the ideas or the material. Thus memory which is improved by use of artificial associates is called Mnemonics. Thus things are learnt verbatim without understanding it .e.g. VIBGYOR whose letters represent the colours of the rainbow.

2. RETENTION: The process of learning involves the stage of retention. Thus learning becomes permanent. 'Retention is the inactive state of learnt activity'. The learning activity leaves a mark on the brain structure. This mark is called a 'Memory Trace' which is imprinted on the Cerebral Cortex. This preservation of the memory trace in the brain is retaining of the learning activity. This can be compared to the traces or marks in the sand e.g. our footprints made on the sand. The deeper the trace, the longer the retention, while the weak traces slowly fade away.

Memory can be improved, but the depth of the trace or retention is difficult to improve by practice, the reason being the traces that are made, depend on the genetic inheritance.

Retention however can be measured in three ways:

a) Recall b) Recognition & c) Relearning.

a) Recall Method: Is a direct method of testing retention, where the capacity to recall & reproduce is tested. We can recall matter, only if we have retained it. e.g. in a writing a test: the pupil's retention & recall is tested. But sometimes we are not able to recall, even when we know the matter. So we cannot measure the retention. Therefore this is the poorest retention score of all that is learnt.

b) Recognition Method: This method is widely used now. A response given from which the pupil has to pick out the correct answer or recognize the correct answer. This ability of recognizing the correct answer helps measure the power of retention. This has a higher score of testing retention than recall method & also puts less strain on the child e.g. multiple choice questions, or questions based on a picture or map.

c) Relearning Method: Lets give an example ABC is learning a long poem & it takes him 20 minutes & 4 trials to memorize it. After a few days ABC again learns the poem & now in 10 minutes & two trials he learns it fully. Thus we can assume that retention has taken place because the time & the number of trials have reduced. Thus this method is the best compared to recognition & recall methods.

3. RECALL- The third aspect of memory is recall. We learn because we need to recall them at some point of time or other. So we can say that recall is the mental revival of past experiences. It is the least index of retention because we are unable to remember even though we know it. Recall depends on the mental condition & the memory trace formed.

4. RECOGNITION – Recall & recognition are closely related. Recall provides the material in memory, while recognition is the process of accepting or rejecting. Recognition is better than recall as an index of retention. Recognition starts with the object given whereas recalls find the object from the mind. Thus, when we meet a person, recognize that person's face, but may not be able to recall his name. Recognition is more a passive behavior than an active process like recall.

Recall	Recognition
1) Recall is the revival of the past the experiences.	1) Recognition is the perception & identification of an object
2) The process begins in the mind.	2) The process begins from the object
3) It is an active mental process	3) It is a passive mental process
4) It is the least index of measuring retention.	4) It is a High index of measuring retention.
e.g. short answer type questions involves recall	e.g. Multiple choice questions, see the picture & recognize the answer. etc involve recognition

FACTORS AFFECTING MEMORY

- **Kind of material**

One can learn or memorize meaningful material more easily than nonsense material. e.g. poetry is generally easier to learn than prose. Prose is easier than a list of disconnected words. Meaningful words are easier to learn than nonsense syllables. Students require less time to learn if the material is meaningful.

- **Age of the learner**

“You can’t teach old dog new tricks” Generally it is presumed that children can memorize easier than adult. A child can be easily motivated to learn while an adult may not. Interests in children are not specific while those of adult become more specific. Adults will therefore require more time to learn if they are not interested in a certain area. Since learning and memorization also depends upon maturation, an adult is likely to get an advantage over the child.

- **Sex:**

Girls show superiority over boys of the same age in their ability to memorize. But here too, the factors like desire to learn, interest, environment, family, motivation influence.

- **Learner’s attitude :**

One who sees that learning of certain material is related to the attainment of his goals, has a more favorable attitude towards studying the material and memorizing it.

- **Knowledge of result.**

If the learner has immediate feedback, he learns the material more rapidly and accurately which helps in better memorization.

- **Interest of the learner.**

Due to interest, the learner learns with a proper attitude and remembers the learnt matter.

- **Length of the series.**

Longer matter is difficult to learn & memorize. If the length of the material to be learnt is shorter, it is easier to memorize.

Check your progress.

1. Explain the components of memory.
2. What are the different types of memories?
3. Enumerate with examples, the different ways in the process of memorizing.
4. What are the different ways of measuring recall?
5. Differentiate between recall and recognition.

5.3 C) FORGETTING- Concept, Types, Causes, Educational Implications

Concept

In our daily life we have experienced the time we want to recall the name of a friend and we realize that we have forgotten it. Forgetting occurs only when some learning has taken place. If there is no learning then there is no forgetting. Thus forgetting & remembering are two sides of the same coin.

So when we are unable to remember it's called forgetting.

Munn: "Forgetting is the loss permanent or temporary of the ability to recall or recognize something learnt earlier"

Drever: "Forgetting means failure at any time to recall an experience, when attempting to do so or perform an action previously done.

Bhatia: "Forgetting is the failure of an individual to review in consciousness an idea or a group of ideas without the help of original stimulus."

Thus forgetting is being unable to find the correct information. (from the mind) at the given situation. Forgetting is temporary at times when later we can remember the names & actions whereas forgetting is said to be permanent when in no situation we are able to recall the information.

Lets see why we are unable to recall information & Why do we forget? What are different types of forgetting?

Types of Forgetting:-

1. Decay through disuse or Theory of Decay:

Forgetting is a process of fading of the learnt matter with passage of time. According to this view, the vivid impressions created in the cerebral cortex fade away as time passes. Such fading or decay could be the result of the normal metabolic processes of the brain. As time passes, these processes might cause the traces of material once learnt to disintegrate gradually and eventually to disappear altogether.

2. Interference of Association or Theory of Interference:

Here we see that forgetting is not caused just by fading away of traces, but by influence of the intervening activities.

a. Retroactive interferences: Here new learning works backward & interferes with old learning.

b. Proactive Inhibition or Interference: Here what we have learnt previously interferes with the new learning. Forgetting in our daily life is more due to proactive interference; our ability to recall what we have learnt is reduced by experiences previously learnt.

3. Theory of Repression or Motivated Forgetting

The two earlier theories are physiological process of affecting mental trace or interference in learning. But here the person is not given importance. For some people, forgetting is a psychological process, where by will the unpleasant or conflicting experiences are repressed & pushed into the unconscious & forgotten. Thus repression is done because it may cause anxiety to remember the experiences e.g. remembering loved ones whom we will never see again, we want to forget those people who hurt us.

CAUSES OF FORGETTING

1. **Inadequate impression at the time of learning:** Inadequate or improper learning is likely to be forgotten. Sometimes we do not care to learn a thing or pay least attention to it. This type of inadequate learning in most of the cases can be a real cause of forgetting.
2. **Lapse of time:** With the passage of time what we learn, gets weaker and finally fade away.
3. **Poor health and defective mental state:** A sound body is said to have a sound mind. Deterioration in health makes an individual less confident. He remains in a state of tension and thus is unable to concentrate upon a thing. He is unable to learn it effectively nor can he recall it.
4. **Repression:** Repression is the active process of forgetting an experience because one wants to forget it. This kind of forgetfulness is wishful. Actually we forget the things which we don't want to remember. e.g. we forget to attend the marriage party which we don't want to attend.
5. **Emotional Disturbance:** Fear, anxiety, stage fright may paralyze recall. Rise in emotions like fear or anger or love lead to forget the learned experiences e.g. a student afraid of a teacher may forget what has been learnt.
6. **Alteration of stimulus condition:** Sometimes forgetting occurs when we have alteration of the stimulating conditions between the time of learning and the time of recall. e.g. a child who learns the meaning of words like cat, rat etc. with the help of pictures feel a great difficulty in naming them in the absence of such pictures.
7. **Forgetting due to interference of association:** It means we forget something because what we have learned previously interferes with the remembering of what we learn afterwards. The interfering effects of associations can work both ways, forward and backward. In retroactive inhibition later learning interferes with earlier learning. In proactive inhibition earlier learning interferes with later learning.
8. **Change of stimulus conditions:** we may have learnt in a specific environment, but we forget in the changed environment e.g. we can say the speech well at home but in front of the audience, we are unable to speak.
9. **Poor Health:** this prevents us from remembering learnt material.
10. **Defective mental state,** fatigue, lack of interest or willingness all lead to forgetting

Factors that help to minimizing Forgetting or Factors, which help to improve Memory

1. **Rate of Learning:** Its a fallacy that rapid learning is associated with rapid forgetting. But the reverse is actually true, in rapid learning forgetting is slow & when learning is slow, forgetting is rapid. Thus a slow learner, would eventually lose interest in the subject thus forget the material rather quickly than a quick learner.
2. **Over learning:** Forgetting takes place as soon as we stop learning. So we must recall immediately after we have learnt & it must continue after intervals. Learning must be carried beyond the point where recall is just barely possible. Over learning, beyond the point of complete mastery, strengthens the impressions in the brain.
3. **Periodic review:** This is very similar to self recitation thus as soon as we learn we start the review of the data. Reviews at frequent intervals prevent the decay of the learnt data or information.
4. **Kind of Material:** Easy, simple, meaningful and logically related materials are easy to retain & forgotten less rapidly. Thus general concepts, scientific interpretations are better retained. Meaningless materials are forgotten quickly. Thus associations make material meaningful & quick to remember.
5. **Intention to Learn:** Firm determination or strong will to learn is required to achieve success. Same material may be given to sets of students wherein one is willing & other is not unwilling to learn. In such cases, retention greater in those students who had a determination to learn.
6. **Proper Methods of Learning:** Economical method must be chosen depending on the material to be learnt, so we chose Spaced versus Mass or Whole versus Part learning.
7. **Self recitation:** After reading a lesson a few times, the student must try to review the whole thing without the help of a book. This method may also be termed as attempted recall and it makes a more economical use of one's study time. It also helps towards permanent retention.

How can we improve the way we learn?:

1. **A will to learn:** Learning is better achieved when there is a drive to learn. Thus without intention, not much learning is achieved.
2. **Use Multiple sensory learning:** Things are better remembered when presented through more than one sense e.g. Matter which is heard & written on the blackboard is retained better than only hearing something

3. **Rehearse and Recite:** Rehearsal & recitation are useful in memorizing as self evaluation is possible and learning can be modified accordingly.
4. **Space your learning:** Spacing what we learn or distributed learning helps better retention of learning as things learnt in small parts are retained longer.
5. **Follow the principle of association:** Associating what we are learning with what we already know helps in remembering . e.g. A for apple, Z for zebra etc.
6. **Use Correlation:** Topics must not be taught or learnt in water tight compartments. Correlate with experiences & related subjects to make learning interesting.
7. **Grouping & rhythm** e.g. multiplication tables and poems are easy to learn because of grouping & rhythm. Use of Mnemonics also aids learning.
8. **Whole to Part to Whole:** Before intensive study, go through the whole matter, understand it, break it to parts & then study it as a whole following the whole to part to whole method.
9. **Take breaks:** Periods of change, rest & sleep helps remove fatigue & monotony. Fresh mind stores meaningful experiences for longer time.
10. **Over learn:** Over learning helps retention. Review and revise very often.
11. **Avoid interference of subject similarity:** Interference causes forgetting so similar situations, subjects, etc .must be spaced out. Complete the work, do sufficient drill work & then begin the next learning situation.
12. **Good Environment:** Better learning environment makes learning interesting & vivid by using teaching aids , adopting new methods and techniques.

Educational Implications of forgetting

1. The greater the acquaintance with the material the greater will be the remembrance. Hence over learning is a must.
2. Comprehensive and thorough initial learning or teaching should be undertaken.
3. Distributed practice should be encouraged rather than massed practice, because it enables the learner to learn without the onset of fatigue, Hence either in learning of skills or memorization of material, distributed practice should be undertaken, taking as large wholes as possible.
4. Association with previous knowledge and with pleasant atmosphere should be aimed at in teaching to lead to a better acquisition of knowledge.

- **Check your progress.**

1. What is forgetting? What are the causes of forgetting?
2. What are the different ways to minimize forgetting?
3. What are the various ways in which a student can improve the ways in which he learns?
4. Explain the causes of forgetting.
5. Describe the educational implications of forgetting.

5.5 LET US SUM UP

- Thinking is 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.
- We think with the help of Percepts, Images / Object, Concepts, Symbols / Signs, and Language.
- **Thinking can be** Convergent (one best answer from many sources), Divergent (different ideas from a source), Critical (assessing the worth and validity of something), Reflective (insightful cognitive thinking), or Lateral (thinking out of the box).
- Memory is the ability to retain & reproduce impressions once perceived
- Types of Memory are Immediate (few seconds), Short term (upto thirty seconds if not chunked or coded) and Permanent (for a fairly long time).
- Retention can be measured through the Recall method, the Recognition method and the Relearning method.
- Registration or learning is done through rote memorization, spacing out the learning material, using whole or part learning, recitation and using mnemonics.
- Forgetting is the inability to find the correct information (from our memory) at the given situation. It can be temporary or permanent. purposeful, controlled, selective and step by step thinking

5.6 UNIT END EXERCISES:

1. Which are the different types of thinking?
2. Differentiate between convergent and divergent thinking.
3. What do you understand by critical thinking?
4. Explain the factors affecting memory.
5. Describe the different types of memory
6. Explain the causes of forgetting.
7. Describe the educational implications of forgetting

5.7 SUGGESTED READING:

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INTELLIGENCE AND CREATIVITY

Unit Structure

6.0 Objectives

6.1 Introduction

6.2 A) Concept of Intelligence, Gardner's Theory of Multiple Intelligence

- Check Your Progress

6.3 B) Emotional Intelligence-Concept, Educational Implications

- Check Your Progress

6.4 C) Creativity- Concept, Educational Implications

- Check Your Progress

6.5 Let us sum-up

6.6 Unit End Exercises

6.7 Suggested Readings

6.0 OBJECTIVE

After completing this unit you should be able to:

- Define the concept of intelligence and explain the Gardner's theory of multiple intelligence.
- Explain the concept of emotional intelligence and its educational implications.
- Define Creativity
- Explain the Characteristics of Creativity
- State the Characteristics of a Creative person
- Explain the concept of creativity and its educational implications.
- Suggests the various ways and means for developing creativity among children

6.1 INTRODUCTION

You know that every individual is a unique being. Along with the features and characteristics shared with over people, i.e. the

universal ones, each individual has many particular characteristics. The individual is born as a man, but only gradually with the help of adults and through his own activity, becomes an individual. As for the adult's influence, the decisive role in this process is played by education which is purposeful, planned, professional and institutionalized. However, the development of the individual is influenced both by internal and external influences. In the process of education and development of personality, the pupil is not only the object of education but also the subject of his own development. These subjective tendencies are intelligence, attitude, aptitude, creativity and interest which are particularly the concern of psychology.

This unit deals with the inner ability of the individual like intelligence which makes one different from others. As we have discussed no two organisms are exactly alike. From birth onward, differences become increasingly apparent, especially in human beings, partly as expressions of hereditary factors and partly through the impact of the environment. Such differences have been recognized since ancient times and they occur in all human abilities including intellectual functions.

You must have observed that two individuals who study the same amount of time for an examination achieve different scores. You also know that some succeed in medical school while others have difficulty even finishing high school. Then question may arise in your mind why do such things happen? Your response to these questions might be that high intelligence leads to success.

Intelligence is one of the most widely used yet most widely debated concepts in scientific and everyday life. Intelligence means different things to different people. Rob showed many intelligent behaviours when working through computer programmes or recalling sports statistics, but he was unable to express his ideas and knowledge of English literature clearly on examination. Many psychologists believe that intelligence does not refer to one special ability but to a group of abilities. All the definitions offered by psychologists share certain common concepts. Let us discuss about the concept of intelligence in detail.

6.2 A) CONCEPT ON INTELLIGENCE

The word intelligence forms part of our own ordinary stock of words which we use everyday. In the field of psychology too, the word intelligence finds a fairly comprehensive use. In fact, there are as many definitions of intelligences as there are writers on the subject. On account of the different ways in which intelligence is interpreted, it has become less acceptable and more exposed to

criticism by psychologists. Nevertheless, it is traditionally acknowledged by the parents and teachers that intelligence is the most important single variable which affects success in school and in life. In general terms, intelligence means the manner with which an individual deals with facts and situations. First, intelligence is defined in terms of observable objective behaviour. Second, most definitions refer both to an individual's capacity to learn and to knowledge that has already been acquired. Many definitions also suggest that the ability to adapt to the environment is a sign of intelligence.

A variety of definitions on intelligence have been suggested by the psychologists which can be classified into at least four distinct groups as follows.

INTELLIGENCE

Ability to Adjust

According to one group of psychologists, intelligence is the general mental adaptability to new problems and new situations of life. Some definitions that come under this group are as follows.

Binet (1905): "Intelligence is the ability of an individual to direct his behaviour towards a goal".

William James (1907): "It is the ability to adjust oneself successfully to a relatively new situation".

J. Piaget (1926): "Intelligence is an adaptation to physical and social environment".

F. N. Freeman (1937); "Intelligence is represented in behaviour by the capacity of the individual to adjust himself to new situations to solve new problems, to learn."

Ability to Learn

This group of definitions of Intelligence stresses the ability to learn. The more intelligent the person, the more readily and extensively he is able to learn and enlarge his field of activity and experience.

Buckingham (1921) "Intelligence is the learning ability."

Superman (1927) "Intelligence may be thought of in terms of two abilities i.e. 'g' or general ability and 's' or 'specific ability'.

Thurstone (1946) defines 'intelligence in terms of five primary abilities i.e. 'S' or Space factor, 'N' or Number factor, 'V' or Verbal

Comprehension factor, 'W' or Word Fluency factor and 'M' or memory factor.'

Ability to do abstract reasoning

This group of definitions maintains that intelligence is the ability to carry on abstract thinking. This implies the effective use of ideas and efficiency in dealing with symbols, specially numerical and verbal symbols.

L. M. Terman (1921): "An individual is intelligent in proportion as he is able to carry on abstract thinking."

P. E. Vernon (1927): "Intelligence is an allround thinking capacity or mental deficiency."

E. L. Thorndike (1931): "We may define intelligence in general as the power of good responses from the point of view of truth or fact."

Henry Garret (1946): "Intelligence is the ability demanded in the solution of problems which require the comprehension and use of symbols i.e. words, numbers diagrams, equations, formula."

Operational definitions :

These categories of definitions are not and perhaps can not be mutually exclusive. They intersect and overlap at many points.

According to P. E. Vernon (1927) "Intelligence is what intelligence test measures."

G. D. Stoddard (1943) says "Intelligence is the ability to undertake activities."

According to Boring (1948) "Intelligence is what intelligence tests".

D. W. Wechster (1950) Says "Intelligence is the aggregate or the global capacity of the individual to act purposefully, to think rationally and to deal effectively with the environment."

Evaluating on the basis of the above definition, we can call a person intelligent in proportion to his being able to use his mental energy in handing his actual life problems and leading a happy and well contented life.

Nature of Intelligence

I am sure that you got idea about what intelligence is. Now we will discuss the nature of intelligence. You may have the experience of discussing about the nature of your friends, parents, teachers etc., but today you will get the joy of discussing the nature of intelligence which changes the nature of persons.

The nature of intelligence was first thought of by a brilliant English Scientist Sir Francis Galton. His general conclusion that intelligence is a hereditary trait is reflected by the title of his book "Hereditary Genius."

As you see that the definition of intelligence is defined differently, so the nature of intelligence is also described by different persons in different ways. For example the school teacher may describe a student as bright, if he learns his lesson easily. The manager of a Super Bazar may regard a Salesman as intelligent and smart if he can satisfy customers and dispose them of quickly. The workshop manager may regard an apprentice as intelligence if the he is skillful in using his hands and his tools. In the above cases, the word 'intelligent' has been used in the sense of "efficient behaviour."

The nature of intelligence also differs according to the nature of work if can do. For example handling ideas and symbols such as words, formulas, numbers and diagrams abstract intelligence is required. A person with abstract intelligence is able to discover relations among symbols and to solve problems. Professionals like doctors, lawyers, literary men as well as business men and statesmen are supposed to possess a high degree of abstract intelligence.

In the same way the ability to deal with machines, equipment and mechanical appliances requires mechanical intelligence. The mechanic, the engineer and the trained industrial worker are supposed to have mechanical intelligence.

Efficiency in getting on well in personal and social affairs requires social intelligence. Salesmen, Diplomats and Ministers are supposed to be socially intelligent. The socially intelligent person makes friends easily and is good in dealing with human beings. In selecting people for different occupations it is useful to know the types of intelligence an applicant possesses.

There are, however, gross variations in the three different types of intelligence not only from person to person but also within the same person. A boy may not be able to learn mathematics but may be ingenious in using mechanical tools. A girl may find chemistry and physics uninteresting but may have the talent to master a foreign language. We do not usually find a student who is very good in one subject and poor in all other subjects. It is rare to find a person who can do only one task very well. On the other hand, it may be found that even average people perform reasonably well. We have discussed on the concept & nature of intelligence. On that basis we can generalize the important nature & characteristics of intelligence as follows.

Intelligence is inherited

The amount of intelligence that a person possesses is inherited and fixed. The amount, though fixed, does not reveal itself at the start of life with the growth of the child, the amount inherited by a child also grows. The general belief is that the growth of intelligence stops and it reaches its limit at the age of sixteen. But you know and it is also true that a man of forty knows more than he was a boy of sixteen. But this does not mean that the amount of intelligence possessed by him has increased. This may be due to his experience. As regards his intelligence, his position remains the same.

Intelligence is influenced by environmental factors

Love, affection, concern & generosity judiciously bestowed on growing children, have very desirable effects on their intelligence. Poor environment retards development of intelligence.

Intelligence helps in adjustment & inventions

An intelligent person has the ability to adjust himself to the changing circumstances with ease, efficiency and speed. He has the capacity to assimilate ideas very quickly and clearly. He can cope with new situations very successfully. All the inventions of the world can be attributed to persons of very high intelligence.

Intelligence has no sex differences

Various studies have been conducted by psychologists & researchers to find out whether women are more intelligent than men and vice versa. The result of these researches hangs in one way or the other. In some of the cases no significant difference has been found. Research studies also show that the average scores of both sexes are strongly similar. Therefore it is proper to think that difference in sex does not contribute towards difference in intelligence.

Intelligence has no racial or cultural differences

Now, students we will see whether a particular race, caste or cultural group is superior to the other in intelligence. This hypothesis was also examined by many research workers. The results of earlier studies proved that intelligence is not the birth right of particular race or group. The bright and the 'dull' can be found in any race, caste or cultural group. In this regard Franze Boas states. "If we were to select the most intelligent, imaginative, energetic and emotionally stable third of mankind, all races would be represented. "you can also take any study & prove it."

Intelligence can be recognized in three broad areas

Students, you know that all the individuals are not same in their physical appearance. Here you will also be able to know that all people are not having same type and same amount of intelligence

in solving all problems. According to Thurstone, intelligent behaviour can be recognized in three broad areas.

Abstract Intelligence	Abstract intelligence is the ability to understand and manage ideas and symbols such as words, numbers etc. In the case of students, this is very close to scholastic aptitude.
Mechanical Intelligence	Mechanical intelligence is the ability to clean, understand and manage things and mechanisms, such as a knife, a gun, a moving machine and automobile etc.
Social Intelligence	Social intelligence is the ability to understand and manage men and women, boys and girls, to act wisely in human relations.

Functions of Intelligence:

- Intelligence directs one's behaviour towards a goal.
- It helps one to adjust to a new situations.
- It helps an individual to adopt to physical and social environment.
- It helps to learn new things and to solve new problems.
- It directs the individual to think rationally and act purposefully.

6.2 A) GARDNER'S THEORY OF MULTIPLE INTELLIGENCE

This theory was propounded by Howard Gardner of Harvard University. Through his theory he challenged the notion of general intelligence. According to him it is not possible to capture an individual's intellectual capacities in a single measure of intelligence. Therefore he tried to give a broad base to the concept of intelligence and its measurement by providing a multiple frame. 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. According to Gardner independent intelligence means each intelligence is a relatively autonomous intellectual potential, which is capable of functioning independently of others. These different types are –

- Linguistic intelligence
- Logical-Mathematical intelligence
- Spatial intelligence
- Musical intelligence
- Bodily kinesthetic intelligence
- Intra-personal intelligence and
- Inter personal intelligence.

Let us discuss about the different types of intelligence & how it functions.

Linguistic Intelligence

This type of human intelligence is responsible for all kinds of Linguistic Competence-abilities, talents and skills. The different components of this type of intelligence are

- Syntax
- Semantics and
- Pragmatics.

It also includes some school-oriented skills such as Written or oral expression and Understanding. This type of intelligence is most visible in professionals like Lawyers, Lecturers, Writers and Lyricists

From this we can conclude that persons having linguistic intelligence can express well orally or by writing. We can also infer that those are in the profession of lawyers & lecturers must have more linguistic intelligence.

Logical-Mathematical Intelligence

This type of intelligence is responsible for all types of abilities, talents and skills in areas related to logic and mathematics. The different components of this type of intelligence are –

- Deductive reasoning
- Inductive reasoning
- Scientific thinking and
- Solving logical puzzles etc.

This type of intelligence is found in the professionals like –

- Mathematicians
- Philosophers
- Physicists etc.

Spatial Intelligence

Abilities, talents & skills involving the representation and manipulation of spatial configuration and relationship is the concern

of this type of intelligence. We use this type of intelligence in the sphere of one's work. This is used by a painter while applying pigments to a canvas. This intelligence is seen in the professionals like -

- Surveyors
- Navigators
- Architects
- Engineers
- Sculptures and
- Chess players.

Musical Intelligence

This type of intelligence covers the abilities, talents and skills relating to the field of music. The different components are -

- Pitch discrimination
- Sensitivity to rhythm
- Ability to hear themes in music.
- Texture and timber.
- Production of music through performance or composition.

It is visible in a quite large proportion in professionals like.

- Musicians and
- Composers.

Bodily Kinesthetic Intelligence

This type of intelligence includes the abilities, talents and skills in using one's body or its various parts to perform skillful and purposeful movements. You must have experienced the cricket match. The batting style of Sachin Tendulkar, the fielding of Jonty Rhodes is the example of their bodily kinesthetic intelligence. This type of intelligence is seen among professionals like – Dancers, Athletes and Surgeons.

Intra Personal Intelligence

This type of intelligence enables one to know his self. It includes knowledge and understanding of one's own cognitive strengths, styles and mental functioning, as well as one's feelings, range of emotions and skills to utilize one's fund of knowledge in practical situations. Therefore it is called as private intelligence. On account of its secret and private nature, the access to this type of intelligence in an individual is available only through self-expression like i.e. language, music, visual, art and similar other forms of expression. In practical life, this type of intelligence is demonstrated by - Yogis, Saints and Masters of zen.

Interpersonal Intelligence

This type of intelligence consists of the abilities to understand individuals other than one's self and one's relations to others. It includes the ability to act productively, based on the

understanding of others. In practical life, this type of intelligence is most visible among

- Psychotherapists
- Teachers
- Sales people
- Politicians and
- Religious leaders.

The contribution of this theory is its bold declaration that the concept of a measurable 'g' is at best limited and at worst educationally misleading. It is not at all essential that an individual highly loaded with linguistic abilities will also display exceptional ability in all or any remaining domains.

• CHECK YOUR PROGRESS – I

Note – Write your answer in the space provided below.

Q.1 Explain the concept of intelligence

Q.2 Explain the Gardner's multiple theory of intelligence

Q.3. Write what type of intelligence is visible in the following professions.

- i) Lecturer
- ii) Doctor
- iii) Engineer
- iv) Philosopher

Q.4. Match the following.

- | A | B |
|-------------------------|--|
| a) Musicians | i) Linguistic intelligence |
| b) Dancers | ii) Intra personal intelligence |
| c) Chess players | iii) logical-mathematical intelligence |
| d) Athletes | iv) Musical intelligence |
| e) Visual Art | v) Bodily kinesthetic intelligence |
| f) Spatial intelligence | vi) Interpersonal intelligence |

6.3 B) EMOTIONAL INTELLIGENCE-CONCEPT EDUCATIONAL IMPLICATIONS

It all began about 2000 years ago when Plato wrote; “All learning has an emotional base.’ Since then, scientists, educators, and philosopher have worked to prove or disapprove the importance of feelings. In the last decade or so, science has discovered a tremendous amount about the role emotions play in our lives. Researchers have found that even more than IQ one’s emotional awareness and abilities to handle feelings will determine success and happiness in all walks of life. Since long, emphasis has been put on the cognitive aspects of intelligence such as logical reasoning, math skills, spatial skills, understanding analogies and verbal skills. Researchers were puzzled by the fact that while IQ could predict to a significant degree the academic performance and, to some degree, professional and personal success, some with fabulous IQ scores were doing poorly in life; one could say that they were wasting their potential by thinking, behaving and communicating in a way that hindered their chances to succeed. One of the major missing contributors to success was emotional intelligence.

The first use of the term "emotional intelligence" is usually attributed to Wayne Payne's doctoral thesis (1985), *A Study of Emotion: Developing Emotional Intelligence* . However, prior to this, the term "emotional intelligence" had appeared in Leuner (1966). Stanley Greenspan (1989) also put forward an EI model, followed by Salovey and Mayer (1990), and Daniel Goleman (1995). The distinction between trait emotional intelligence and ability emotional intelligence was introduced in 2000.

The Concept of Emotional Intelligence

According to Freedman “Emotional Intelligence is a way of recognizing, understanding, and choosing how we think, feel, and act. It shapes our interactions with others and our understanding of ourselves. It defines how and what we learn; it allows us to set priorities; it determines the majority of our daily actions. Research suggests, it is responsible for as much as 80% of the “success” in our lives”.

The term “Emotional Intelligence” was first coined by Salovey of Yale University and Mayer of the University of New Hampshire in 1990. They described Emotional Intelligence as a form of social intelligence that involves the ability to monitor one’s own and other’s feeling and emotions, to discriminate among them, and to use this information to guide one’s thinking and action.

Salovey and Mayer's conception of EI strives to define EI within the confines of the standard criteria for a new intelligence. Following their continuing research, their initial definition of EI was revised to "The ability to perceive emotion, integrate emotion to facilitate thought, understand emotions and to regulate emotions to promote personal growth."

The ability-based model views emotions as useful sources of information that help one to make sense of and navigate the social environment. The model proposes that individuals vary in their ability to process information of an emotional nature and in their ability to relate emotional processing to a wider cognition. This ability is seen to manifest itself in certain adaptive behaviors. The model claims that EI includes four types of abilities:

1. **Perceiving emotions** – the ability to detect and decipher emotions in faces, pictures, voices, and cultural artifacts—including the ability to identify one's own emotions. Perceiving emotions represents a basic aspect of emotional intelligence, as it makes all other processing of emotional information possible.
2. **Using emotions** – the ability to harness emotions to facilitate various cognitive activities, such as thinking and problem solving. The emotionally intelligent person can capitalize fully upon his or her changing moods in order to best fit the task at hand.
3. **Understanding emotions** – the ability to comprehend emotional language and to appreciate complicated relationships among emotions. For example, understanding emotions encompasses the ability to be sensitive to slight variations between emotions, and the ability to recognize and describe how emotions evolve over time.
4. **Managing emotions** – the ability to regulate emotions in both ourselves and in others. Therefore, the emotionally intelligent person can harness emotions, even negative ones, and manage them to achieve intended goals.

The ability EI model has been criticized in the research for lacking face and predictive validity in the workplace.

Daniel Goleman: The concept of emotional intelligence was made popular by the ground breaking book by psychologist Daniel Goleman. His book 'Emotional Intelligence; Why It Can Matter More Than IQ' has brought to the world's attention that it is our emotions, not cognitive skills that affect our level of relationship satisfaction, health and happiness, and effectiveness in life

The model introduced by Daniel Goleman focuses on EI as a wide array of competencies and skills that drive leadership performance. Goleman's model outlines five main EI constructs (for

more details see "What Makes A Leader" by Daniel Goleman, best of Harvard Business Review 1998):

1. **Self-awareness** – the ability to know one's emotions, strengths, weaknesses, drives, values and goals and recognize their impact on others while using gut feelings to guide decisions.
2. **Self-regulation** – involves controlling or redirecting one's disruptive emotions and impulses and adapting to changing circumstances.
3. **Social skill** – managing relationships to move people in the desired direction
4. **Empathy** - considering other people's feelings especially when making decisions and
5. **Motivation** - being driven to achieve for the sake of achievement.

Goleman includes a set of emotional competencies within each construct of EI. Emotional competencies are not innate talents, but rather learned capabilities that must be worked on and can be developed to achieve outstanding performance. Goleman points that individuals are born with a general emotional intelligence that determines their potential for learning emotional competencies. Goleman's model of EI has been criticized in the research literature as mere "pop psychology" (Mayer, Roberts, & Barsade, 2008).

Educational Implications: Why is emotional intelligence (EQ) so important?

As we know, it's not the smartest people that are the most successful or the most fulfilled in life. You probably know people who are academically brilliant and yet are socially inept and unsuccessful at work or in their personal relationships. Intellectual intelligence or IQ isn't enough on its own to be successful in life. IQ can help you get into college but it's EQ that will help you manage the stress and emotions of sitting your final exams.

Emotional Intelligence affects:

- **Your performance at work.** Emotional intelligence can help you navigate the social complexities of the workplace, lead and motivate others, and excel in your career. In fact, when it comes to gauging candidates for jobs, many companies now view emotional intelligence as being as important as technical ability and require EQ testing before hiring.
- **Your physical health.** If you're unable to manage your stress levels, it can lead to serious health problems. Uncontrolled stress can raise blood pressure, suppress the immune system, increase the risk of heart attack and stroke, contribute to infertility, and speed up the aging process. The

first step to improving emotional intelligence is to learn how to relieve stress.

- **Your mental health.** Uncontrolled stress can also impact your mental health, making you vulnerable to anxiety and depression. If you are unable to understand and manage your emotions, you'll also be open to mood swings, while an inability to form strong relationships can leave you feeling lonely and isolated.
- **Your relationships.** By understanding your emotions and how to control them, you're better able to express how you feel and understand how others are feeling. This allows you to communicate more effectively and forge stronger relationships, both at work and in your personal life.

6.4 C) CREATIVITY-CONCEPT EDUCATIONAL IMPLICATIONS

Dear Students, you know that thinking, problem; solving and creating some things which are novel to the person are some of the most complex activities of the human being. In the last chapter, we have discussed that intelligence of a person helps him to think rationally and to deal effectively with the environment. Individual differ from one another in their amount of intelligence. Here in this chapter you will know about creativity. You will also able to know like intelligence, creativity also differs from individual to individual. Creativity is very important for the progress and major advances in every field. All the advances are made as a result of new ideas or creative process. It is the basis of the entire social development and new inventions and discoveries in the field or science and technology. Now, you may be very curious to know more about creativity which is so important in our life. Let us discuss more details about it.

Concept of creativity

Creativity was believed to be a gift of God which was to be found in highly talented people and geniuses. Therefore, the view that the very intelligent or very superior people would also be creative was held. Creativity was regarded as a rare quality of distinguished individuals. A creative person has an inborn talent. The relationship between creativity and intelligence is neither linear nor curvilinear. For a longtime creativity was considered to be associated with artistic individuals who have distinguished in various fields as painters, sculptures or writers, Creativity is distinguished by novelty, originality and is unusually inventive.

The more important feature of recent research is that creativity is not an extra ordinary gift, but a basic ability of all human beings. All persons to a certain degree are creative. Helvetius (1758) was the first to recognize creativity not as a divine gift, but as a human quality. Contrary to the long held idea that it is a divine gift, it is now accepted that creativity exists in every sphere of human activity. People differ greatly on the degree of creativity. Their creative abilities may not have been realized and remain untapped owing to lack of proper stimulating conditions or owing to long neglect. You can be a creative person by creating something new of your own ideas. Let us discuss how you can also create something.

Creativity is the power of the mind to form new ideas and thoughts. It helps you imagine something new and special. For example drawing, painting, writing, comes from being able to wonder, appreciate and think about things and be inspired by them. For example if you draw well and you see a beautiful painting, you begin to wonder at its beauty. You ask yourself why you should not paint something as beautiful as the picture you have seen. Next day, you begin to draw or paint something of your own which is more beautiful than that you have seen. This is your creativity. So creativity brings out something special in you. Now, you must be clear about the concept of creativity. We will discuss some more examples of creativity for better clarity.

You know that many great poets have written poems on someone or something that made them wonder. Rudyard Kipling wondered about how a perfect man would be and wrote one of his most famous poem 'If'. William Words Worth, on seeing a bed of daffodils was so wonderstruck by its beauty that the poem "daffodils" just flowed from his pen. Yet, the daffodil is one of the commonest blooms in England and millions just took them for granted and still do.

In the same way great painters made their most famous paintings. It is believed that Leonardo Da Vinci was inspired by a lady to paint the 'Monalisa'. You also know that Shahjahan's amazing love for his wife Mumtaz Mahal, inspired the wonderful building the "Tajmahal". Many very creative people wonder at even the tiniest, everyday aspects of life and then make their ideas into great works of painting, scripture and literature. You can also take up something you enjoy like drawing, music, dance etc. as you begin to enjoy it, you will become more and more creative in it. Even, ordinary, everyday things can be made into works of art like vegetable carving, doll making and matchbooks building etc.

Some of the definitions given by different psychologists will also help us to get the meaning more clear.

Definitions of Creativity

“Creativity is the capacity of a person to produce compositions, products or ideas which are essentially new or novel and previously unknown to the producer.”

- **Drevdhal, J. E.**

“Creative is a process extended in time and characterized by original adaptiveness and realization.”

- **Mc Kinnon**

“A process is creative when it results in a novel work that is accepted as tenable, useful or satisfying by a group at a point in time.”

- **Taylor**

“Creativity is a process sensing gaps or disturbing missing elements, forming ideas or hypotheses communicating the result, possibly modifying and re-testing hypotheses.”

- **Torrance**

“It is distinguished between discovery, invention and creativity by saying that fact is discovered, theory is invented by only a masterpiece is created.”

- **Bronowsky**

If we will analyse the definitions of creativity, it seems to fall under four categories.

- The person who Creates
- Mental processes asserting within the person who creates.
- Cultural and environmental factors working on the creator.
- Products of creativity, i.e. poems, paintings, theories and inventions.

Nature and Characteristics of Creativity

All the definitions reveal the nature & characteristics of creativity.

- Creativity is the resultant of some interaction.
- Creativity is the ability to synthesize ideas or objects.
- It is a ability to create new ideas, theories or objects.
- It is a ability to develop something original.
- It is a process as well as a product.
- It is a complex & dynamic process.
- It knows no special medium, place, person or time.
- It is the capacity to accept challenges.
- It is readiness to change self and environment.

Though, creativity has some general characteristics, its nature of work differs from person to person. For example creativity to the artist is the ability to evoke an emotional mood. To the architect, it is the ability to evolve new approaches, forms and new materials. To the Scientist, creativity is the ability to explore new way of extending knowledge. To the teacher, it is the ability to discover and apply dynamic methods of teaching learning whereas to the student it is the ability to use words and phrases in new situations, to solve sum speedily, to prepare new types of charts, to write essays and stories depicting new ideas.

Students, till now you learnt about creativity, its concept, nature & characteristics. Now you will know the characteristics of a creative personality.

Torrence has compiled a list of eighty four characteristics of a creative person.

some of these are:-

- A creative person is very adventurous.
- He is flexible in his thinking, feeling & doing.
- He is very keen to explore and invent.
- He is intuitive, self disciplined, visionary & willing to take risk.

On the whole, creative children are constantly probing, discovering, imagining, asking questions, guessing and wondering. Therefore, they should be encouraged to ask unusual questions, to explore new ways of thinking, to try novel approaches to problem solving, to play with ideas and material etc.

Educational Implications of Creativity

If anything you will prepare, you must think how this can be used. Here you know that how creativity can be identified & you also have prepared a creativity test. So you should use it. Before using it, you should know how you can use it.

You know that creativity is a natural endowment. It needs stimulation and nourishment. Most creative talent, if not given proper training, education and opportunity for creativity expression, results in wastage. Moreover, creativity is universal. It is not the monopoly of a few geniuses only. Everyone of us to certain degree possesses creative abilities. In a democratic set up like owners, it is not only the geniuses who are needed to create, manifest and produce, others whether mediocre or below averages are also required to think, to construct and to creative.

Creativity tests are useful in finding the nature and amount of creativity among the children. This also helps us to provide proper

environment and guidance to develop the originality of the individual in a fully fledged way. We can organize various activities and situations to develop creativity among children according to their abilities. These are:-

Freedom to Respond:

Adequate freedom should be given to children in responding to a situation. They should be encouraged to think about as many ideas as they may for the solution of a problem.

Opportunity for involvement:

The feelings like “It is my creation”, “I have solved” give much satisfaction to children. Therefore opportunity should be provided to them to derive satisfaction from creating.

Encouraging originality and flexibility:

Originality on the part of children in any form should be encouraged. They should also be asked to solve problems. In learning a task if they need to change their methods of learning. They should essentially be encouraged to do it.

Removal of hesitation and fear:

The cause of hesitation and fear for doing any work should be discovered and removed as far as possible.

Providing appropriate opportunities and atmosphere:

A healthy favorable atmosphere for creative thinking and expression is an essential condition for the stimulation and nourishment of creativity among children.

Developing healthy habits among children:

Industriousness, persistence, reliance and self confidence are some of the qualities that are helpful in creative output. Therefore children should be helped to imbibe these qualities.

Using the creative resources of the Community:

Children should be made to visit the centers of creative art or scientific and industrial creative work. Occasionally, the creative artists, scientists or creative persons from other fields may also invited to schools to help enhance the span of knowledge of children and kindly the spark of creativity among them.

Avoidance of Blocks to Creative thinking:

Factors like conservatism, faulty methods of teaching, rigid habits of work, unsympathetic treatment should be avoided.

Proper organization of the curriculum:

Curriculum should reflect what it desires from the creative children in terms of fluency, flexibility, originality, divergent thinking, inventiveness and elaboration etc.

Use of Special Techniques:

Besides these uses, special techniques also should be used to foster creativity, Researchers have suggested some special techniques like. Brain Storming: It is a technique which emphasizes the important of divergent thinking. It involves generating ideas in response to some problems in a group. It allows children to attack and solve a problem without any inhibition or restriction.

Providing the self examples and ideals

“Self example is better than precept.’ Children are very imitative. Therefore the presents, teachers and elders should try to develop the habit of creative thinking among themselves.

Besides these, gaming techniques, encouraging debates, discussions, providing activities like drama, dance music etc. should be arranged for the children to develop their creativity.

After identifying creative children, adequate and appropriate provisions should be made for their education and training, because the future of mankind depends upon the development of their creative potential.

• Check Your Progress – II

Note : Write your answer on the space given below

- i. Write what according to you should be the main three characteristics of “Creativity”.
- ii. Write any four characteristics you observe in a creative person.
- iii. Explain the concept of Creativity
- iv. Write a short note on educational implications of creativity

6.5 LET US SUM UP

You would recall that we have touched upon the following learning items in this unit. Intelligence is a mental trait which expresses itself in various forms. It is an inborn natural power. It helps a man in learning things and to solve complicated, problem and comprehend issues and situations. Intelligence can be

measured by different types of intelligence tests like individual, group, verbal, nonverbal and performance tests of intelligence.

Intelligence is measured through a complicated process which involves a comparison and establishment of a relationship between chronological age and mental age. It is expressed by the term I. Q. Intelligence Quotient.

Intelligence tests are used in solving educational problems. With the help of intelligence tests, occupational, social and personal guidance can be easily furnished. These tests are, however, required to be used with great care and caution and only by experts in the field.

In this unit we have discussed that creativity is necessary for problem solving. But do all problems demand creative solutions? No. For example there is only one correct answer to the question a how much is 75 plus 25? But an architect asked to design a new museum for a particular community might produce a variety of design solutions. When asked to solve a problem or form a concept, people may respond without much thought in a pre determined manner or they may form a hypothesis and then test it to evaluate potential solutions. For particularly difficult problems, a creative solution is often best, although it may not be an obvious one. A creative solution is one that makes others say 'why did I not think of that? It is not always easy to define a creative solution. Similarly, it is not always easy to identify a creative individual.

This unit gives you an idea about creativity. It is the process of developing original, novel and yet appropriate response to a problem. A novel response is one that is new or that has no precedent. An original response is one that is not usually given. However, unless an original and novel solution is also appropriate, it cannot be termed creative, though not too easy, still by observing carefully the characteristics of a creative person and administering different creativity tests, a creative person can be identified by you. On that basis you can create situations, provide facilities to develop creativity among them. Sometimes creative individuals experience a sudden brilliant illumination, but more often their new ideas come about through a slow intuitive understanding of the field of endeavor. Their back-ground allows them to be constructively creative. This unit is an attempt to give an outline of how the nature and characteristics of creativity & creative individuals help in identifying creative individuals. Different types of creativity tests & their uses in educational situations are also part of this unit. In short, this unit gives awareness to the parents, teachers and elders about their role in promoting creativity among children.

6.6 UNIT END EXERCISES:

1. Explain the meaning and nature of intelligence.
2. Explain the different types of intelligence tests with examples.
3. Write short notes on the following (In 150 words)
 - a) Concept of Intelligence
 - b) Inter and Intra Personal Intelligence
 - c) Bodily Kinetics Intelligence.
 - d) Spatial Intelligence.
4. Explain the concept of Emotional Intelligence
5. Explain the educational implications of emotional intelligence.
6. What is creativity? Explain its nature & characteristics.
7. Who is a creative child? What are his chief characteristics?
8. Define creativity. Explain how you can identify creativity among children.
9. Explain the role of parents and teachers in the promotion of creativity in children.

6.7 SUGGESTED READINGS

1. Baron, R.A (2002) *Psychology*, Fifth Edition. Singapore, Pearson Education Asia.
2. Benjamin B. Lahey (2002): *Essentials Of Psychology*, International Edition, Mc Graw Hill
3. Dash Muralidhar (2009) : *Educational Psychology*, Reprinted Deep & Deep Publications Pvt Ltd
4. Skinner C. E, (2003): *Educational Psychology*, Fourth Edition, Prentice Hall of India Private Limited, New Delhi.
5. Woolfolk, A (2009) *Educational Psychology*, Ninth Edition Singapore, Pearson Education Inc.



PERSONALITY, MENTAL HEALTH, MALADJUSTMENT

Unit Structure

7.0 Objectives

7.1 Introduction

7.2 A) Personality- Concept, Self-Concept, Self Esteem

- Check Your Progress

7.3 B) Mental Health- Concept and Importance

- Check Your Progress

7.4 C) Maladjustment-Causes and Prevention

- Check Your Progress

7.5 Lets sum up

7.6 Unit End Exercise

7.7 Suggested Readings

7.0 OBJECTIVES

After going through this unit, you will able to

- Explain the concept of Personality
- Explain 'Self Concept' and 'Self-Esteem'
- Explain the meaning of Mental Health
- Describe characteristics of Mental Health.
- Explain importance of Mental Health
- Explain concept of Maladjustment
- Explain the causes of maladjustment
- Discuss the preventive measures of maladjustment

7.1 INTRODUCTION:

In child centered education, child has been given utmost importance. The Child's personality plays major role in teaching learning process. Personality is often misused in describing outer appearance of the person. Personality is more than that. It covers

inner as well as outer look. Attitude and aptitude reflect in the type of personality. Importance of mental health, role of school and teachers in improving personality / adjustment is discussed in this unit.

7.2 PERSONALITY

Personality is the individual considered as a whole. It may be defined as ‘the most characteristic integration of an individual structure, modes of interest, attitudes, behaviour and capacities’. - **Muirhead**

Personality is a term that has been used very widely to mean some different aspects of a person. Every society and in it every school, takes a profound interest in the development of the personality of children. Etymologically, the word ‘personality’ has been derived from the Latin word ‘Persona’. At first this word was used for the mask worn by the actors to change their appearance but later on, it began to be used for the actors themselves. Since then, the term ‘personality’ has been used to depict outward appearance or external behavior etc.

Definitions of the personality:

N.L.Munn – ‘Personality may be defined as the most characteristic – integration of an individuals structure, modes of behavior, interest, attitudes, capacities, abilities and aptitudes’.

C.V.Good – ‘The total psychological and social reaction of an individual, the synthesis of his subjective, emotional and mental life is his personality.’

Valentine – ‘Personality is the sum total of innate and acquired dispositions’.

Characteristics of personality:

Personality has got certain important characteristics :

1. Personality is always dynamic
2. Personality determines our thinking, reasoning and actions.
3. Personality is both physical and psychological (outer and inner).
4. Personality develops through social interaction.
5. Every personality has some uniqueness.
6. Personality has organized and integrated system.
7. Personality refers to the process of adjustment to our environment.

In short:

- P- Perception capacity
- E- Emotional maturity
- R- Responsiveness to situations
- S- Self-expression or sociability
- O- Organized
- N- Not permanent (Flexible)
- A- Appearance
- L- Leadership feeling
- I- Integrated
- T- Tendencies, impulses, dispositions, (innate & acquired)
- Y- Young, vital and unique

No two individuals are alike and that is what makes life interesting and exciting. The emphasis is on growth and development than on genetic endowment.

SELF CONCEPT

Definition – Psychologically, the whole set of attitudes opinions and cognitions that a person has of himself, is his self concept.

Self Concept is a multidimensional construct that refers to an individual's perception of 'self' in relation to any number of characteristics, such as academics (and non academics), gender roles and sexuality, racial identity and many others. The idea of self concept is utilized in many disciplines including psychology, philosophy, sociology, nursing, biology and anthropology. There is no consensus as to how to define "Self concept using terms of specificity.

At present the development of self concept among the students is worrying. Most students have low self concept and they are passive in their achievements in school.

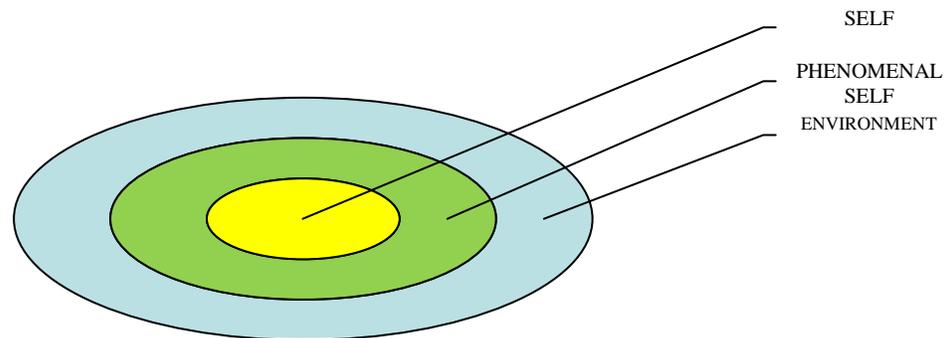
According to Gadeyne, E, Ghesquiere, P, & Onghene P. (2004) to develop the students positive self concept, parents need to provide a harmonious household climate, full of happiness and have adequate necessities, while teachers in schools also need to provide a conducive learning environment and be sensitive to the psychological needs of the students.

According to Azizi et al (2005), any man has a picture or perception of himself. This includes looks and appearance, physical health, ability, weakness and his behaviour. Thus self concept is how one evaluates or judges himself that is either in a positive or negative way. Self concept can be classified into two major types that are positive self concept and negative self concept. The

positive self concept is about a circumstance or situation in which an individual is confident and sure of him, has good interests, is objective and not too sensitive. A negative self concept is when an individual has too subjective nature.

The individual's perception or view of himself is known as his self concept. The part the environment in which he is involved is known as his Phenomenal self and the rest of the environment of which he is aware or to which he responds is called as his phenomenal environment or perceived environment.

It can be represented diagrammatically as follows.



The self-concept is what the individual thinks of as his actual self. Its 'one'. The phenomenal or perceived self includes the self-concept and those aspects of the environment that an individual identifies with himself. For example my family,' "my school", "my home" etc. Both the self-concept and phenomenal self are included within the phenomenal environment. For example "Personal field", 'behavioral field', "psychological field or 'life space' of an individual

To an individual, his phenomenal field or private world is reality. so far as he is concerned. Thus he reacts to the world, which he perceives, not the world as perceived by others. This is also conditioned by one's psychological needs & with his maturity. For example if you tell a child to stay with another woman having more facilities instead of staying with his mother, he will not agree to leave his mother. This is due to his need of love which he perceives in his mother. So also in case of maturity we cannot change the attitude or develop a concept forcibly in the mind of a child if he does not have attained the maturity for that.

A number of research studies conducted in this field have brought out some very significant conclusions like:

- Students of different streams like arts, science & professionals have different self-concept.
- Praise & blame has its role in changing the self-concept. Various studies upon children of various age groups clearly emphasize the importance of self-concept.

Importance of Self Concept

Self concept is important in influencing one's goal. Persons with equally high levels of aspiration but quite different self concepts may set quite different goals.

For example – a person who considers himself intellectual and has succeeded in school may decide that he wants to become a college professor or a noted scientist and he perhaps maintains these personal goals. At the same time another person who considers himself intellectual may have experienced failures in school. But in keeping with his self-concept, however, he still may aspire to attain intellectual goals like writing popular magazine articles or becoming an authority on some topic for which formal schooling & certificate is not required. Therefore one's self concept plays an important role in his behavior, even in childhood, and influences not only the goals he sets for himself but also the ways in which he goes about achieving these goals.

Conversely, one's achievement is an important factor in his self-concept. Many of the personal goals, which we have discussed, are concerned with ways in which the individual can enhance or protect his self-concept. In our culture, achievement is one of the most common ways of enhancing the self-concept, but persons also may strive to be charitable, social, creative or highly religious. T. S. Eliot expressed the importance of the self-concept in human motivation, describing people as “absorbed in the endless struggle to think well of themselves.”

It has also been shown that among welfare clients, the length of time a person has been on welfare is inversely associated with his level of self-esteem. So self-concept also helps in achieving self-esteem.

Self Esteem

In the chapter motivation you have learnt the Maslow's theory. In this theory you have also read the motivational hierarchy where the motivational needs are leveled from physiological needs to self-actualization, the desire to utilize the personal capacities.

Self-esteem is the level above love and belonging & below self actualization. When love and belongingness needs are

satisfied, self esteem motives become important. This motive involves the desire for:

- Respect
- Confidence and
- Admiration

At the esteem level, presumably the desire for affectionate relationships has been fulfilled and then achievement, superiority and prestige motives become important which also fulfilled in the highest-level “Self-actualization” is desiring to utilize one’s personal capacities. You have already known that this hierarchy can be used to motivate an individual to learn. But in this chapter you become aware that it also helps in the development of personality. When one’s self-esteem motives fulfilled, automatically his personality changes.

Self-esteem is also a characteristic of normal or well-adjusted person.

The well-adjusted person has some appreciation of his own self worth and feels accepted by those around him. He is comfortable with other people and is able to react spontaneously in social situations. At the same time, he does not always feel obligated to subjugate his opinions to those of the groups. Self-esteem therefore is important for mental health. To show the position of self-esteem you can also show the diagram of Maslow’s motivational hierarchy.



Relation between Self-concept and Self-esteem

The single most important aspect of an individual's subjective world is the view he has of himself, often referred to as his self-image or self-concept. The self-concept is what the person thinks he is, regardless of his actual nature or his appearance to others.

Self-esteem means self-respect, self-confidence, feeling of strength & adequacy. Self-esteem includes the perceived self as well as ideal self. It gives worth to other's thinking towards him.

Self-concept is essential for self-esteem. But self-esteem is a universal desire. For example whatever may be your nature, good or bad you always want you should be loved & respected by others. If you are good you will be loved & respected by other. If not, you may not. But you want to be respected by others. So when there is mis-match between one's perceived self and ideal self, it can be very disturbing.

Our self-concept develops on the basis of information about the way we are and the way others see us. So self-concept is a broad term. It includes in it two distinct sets of meaning. One set has to do with people's attitudes about themselves, their picture of the way they look and act, the impact they believe they have on others and their perceived traits, abilities and weaknesses. This collection constitutes what is known as the self-concept, or self image, "attitudes, feelings, perceptions & evaluation of self as an object.

The second set of meanings relates to the executive functions-processes by which the individual manages, copes, thinks, remembers, perceives and plans.

Sometimes we may change our perception of our experiences in self serving ways, because we need self-esteem.

• CHECK YOUR PROGRESS-II

Q.1. Fill in the blanks by choosing the correct answer.

- i) Self-esteem is _____ in nature.
(Personal, social, universal, moral)
- ii) Self concept is _____ in nature.
(Individual, personal, psychological, psychosocial)
- iii) Self-esteem lies in Maslow's hierarchy above _____ level.
(Safety needs, self actualization, physiological needs)
- iv) Self-esteem related to self-_____ Love, respect, peace, attitude)

Q.2 Match the group

A
Self-concept
Phenomenal self
Phenomenal environment

B
life space
my family
I Me

Q.3 Categorize these statements into self-concept & self esteem.

- a) Praise has its role on changing one’s attitude
- b) Science students have different thinking than arts students.
- c) Writing for popular magazines after failure in school.
- d) Absorption of individual to useful work.
- e) The level of human motives below self-actualization.

Q.4. a) Write two uses of self-esteem in human life.

b) Write the two distinct sets of meaning of “self”.

7.3 MENTAL HEALTH- Concept and Importance

Concept

One of the most important aims of education is to help the individual in making adjustment with the changing environment. It is the mental health which helps the person to adjust in the environment.

Mental health stands for the health of the mind Carter V. Good in the Dictionary of Education (1959 P. 263) has termed it as. “The wholesomeness of the mind.”

It is a state or condition on which an individual feels a sense of well being. This condition also provides an individual the capacity to be resilient to the stresses her / meets and to respond to these challenges without having to compromise his well being. This also makes him productive and fruitful for himself and his community.

WHO defines mental health as – A state of complete physical, mental and social well being and not merely the absence of disease or infirmity (2001).

Definition – A state of emotional and psychological well being in which an individual is able to use his or her cognitive and emotional capabilities function in society, and meet the ordinary demands of every day life.

Characteristics of mental health:

1. Nothing called perfect mental health – No person is with perfect mental health rather it is optimum mental health.
2. Mental health is a dynamic concept: Mental health denotes a state of balance or equilibrium of our mind, this balance is not static, it is quite dynamic.
3. Mental health can't be achieved without physical health. For achieving an optimal level of mental health one has to first acquire adequate physical health.
4. Mental health and efficiency are not the same thing – One may be quite efficient and successful at his work or profession but he could be most unhappy, full of anxiety etc.
5. Mental health and social ability are not the same thing- A mentally healthy person is sociable. It is not necessary for a sociable or socially adaptable person to be healthy minded.
6. Mental health differs from ethical standards – Morality does not guarantee mental health.

Importance of Mental Health-

Mental health has much wider scope than physical health as it aims for the development of wholesome balanced and integrated personality.

Mental health is very important because of following things:

1. **Helps in the development of desirable personality** – Mental health helps in the development of a wholesome, well-balanced and integrated personality.
2. **Helps in proper emotional development** – The individuals who enjoy good mental health are supposed to demonstrate proper emotional maturity in their behaviour. On the other side, those who are tense, disintegrated and mentally unhealthy demonstrate sudden emotional outburst.
3. **Helps in proper social development-** One's mental health helps one in becoming sociable and establishing proper social relationships in the society.

- 4. **Helps in proper moral development** – The individuals who enjoy sound mental health are usually found to behave as men of integrity and character by following the ethical standards of the society.
 - 5. **Helps in proper aesthetic development** – Proper mental health helps the individual in the development of appropriate aesthetic sense, artistic taste and refined temperament.
 - 6. **Helps in seeking proper adjustment** – A mentally healthy individual is an adjusted person. He is able to adjust his needs as per the demands of the situation and well being of the society.
 - 7. **Helps in seeking goals of life** – Optimum mental health always helps the individuals to divert his energies in full capacity for the realization of the goals.
 - 8. **Helps in progress of the society** – Mental health helps the individual to develop as well balanced useful citizens who are conscious not only of their rights but also of their responsibilities.
 - 9. **Helps in prevention of mental illness** – A sound mental health and balanced personality has enough resistance to fight against the odds of life and bear the accidental stresses and strains of life in comparison to those with impaired mental health.
- **Check you progress:**
 - 1. What are the characteristics of mental health?
 - 2. Elucidate importance of mental health

7.4 MALADJUSTMENT- Causes and Prevention

Adjustment is the process by which a living organism maintains a balance between its needs and the circumstances that

influence the satisfaction of these needs. An individual's adjustment is adequate, wholesome or healthy to the extent that he has established harmonious relationship between himself and the conditions, situations and persons who comprise his physical and social environment.

Maladjustment refers to disharmony between the person and his environment. Contrary to adjustment, maladjustment represents a condition or a state in which one feels that one's needs are not fulfilled and he has been a failure in establishing harmony with his self and the environment.

Causes of maladjustments:

The causes of one's maladjustment to his self and the environment may be both of personal as well as environmental

Following are the causes of maladjustment:

1. **Unhealthy home environment** – Include separated family, divorced family, step parent, drunkard or drug addicted parents, single parenting, low moral and social standard of family.
2. **Heredity causes** – One may feel inferior because of inherited defective mental set up, physiological structure, colour of the skin (dark) which could lead to maladjustment.
3. **Poverty** – When poor children meet rich children in the school, they sometimes develop jealousy, worry and inferiority complex which lead to emotional disturbance.
4. **Environment causes** – The forces of the environment begin to play their role from the conception of the child in the womb of the mother in the form of defective nourishment available to him. Uncongenial physical environment, adverse physical environment leads to maladjustment.
5. **Faulty method of teaching** – Faulty method of teaching do not motivate students. The Lesson becomes dull and drudgery. Student begin to hate every process of education. It creates emotional tension which lead to mental illness.
6. **Strict Discipline** – Some traditional schools impose strict discipline, such schools are just like jails and the teachers jailors. Those students are always suffering from fear and worry.
7. **Lack of equipments (facility)**- In some schools, there is lack of furniture and proper equipments. Over crowded classes and poor facilities leads to frustration and mental tension.

8. **Lack of guidance and counseling** – Mastery over content and subject matter only without caring for the interest of students causes maladjustment. No guidance is provided for various areas at different levels. Students became confused, frustrated and become maladjusted.
9. **Lack of recreational facilities** – Children who do not get facilities after class in the forms of play, library, debates, discussion, puzzles etc. may have adjustment Problems.
10. **Mass media** – Children are exposed to mass media, explosion of knowledge, adult issues now a days. If the child witnesses films which depict low sexuality and violence, it may lead to maladjustment.
11. **Social laws and bindings** – The social laws and legal binding are the most common source of frustrations in one's life. Similarly restrictions imposed by parents, teachers, ethical and other groups are common sources of maladjustment.
12. **Bad company / neighborhood** – Neighbourhood is an important conditioner of child's behaviour. Many of our youngsters develop delinquencies because such patterns of behaviour are seen in their neighborhood patterns like lying, stealing, obscene talk, promiscuous sex interest.

PREVENTIVE MEASURES OF MALADJUSTMENT

Following are the measures which prevent maladjustment;

1. **Proper encouragement** – Parents and teachers should speak daily with the child about his daily activities. So the child can begin to learn the principles of socialization.
2. **Proper appreciation** – Parents and teachers should directly praise the child for the good things he has done.
3. **Delegating responsibility** – Parents and teachers should assign some responsibility to the child. This responsibility should evolve tasks which the child perceives as real and important.
4. **Provision of entertainment** – Provide entertainment facilities like parks, sports clubs, amusement places, theaters, museum to children. We should encourage the child to engage in playing with his peers.
5. **Testing** – Refer the child for special education testing. In some instances, maladjusted children are eligible for special education services.

- 6. **Pattern of relaxation** – The teacher should set a pattern of calmness. Yoga, meditation, stress management courses plays very important roles in preventing maladjustment.
- 7. **Informing progress** – Teacher should inform the child of the progress he is making.
- 8. **Timely help** – Teacher should help the child when he needs it and not only when he asks for it. If the teacher is wise enough to know when the child requires help, he may be able to help him avoid many traumatic failure experiences.
- 9. **Moral Education** – School should provide value education through various methods. Self confidence, co-operation, caring and sharing are the values that can be inculcated through co-curricular programmes.
- 10. **Guidance and counseling** – If the teacher works as a guide and counselor for parents and children, many of the negative situations can be turned into positive ones which are beneficial to students.

- **Check your progress:**

- 1. Describe concept of maladjustment
- 2. Explain causes of maladjustment
- 3. Discuss what the preventive measures of maladjustment are.

7.5 LET US SUM UP

In this unit we have covered the following points:

Concept of personality and Self-concept as one of the factors of development of personality It is also called as the determinants of personality. Self-concept means:

- The feelings of 'me', Perception of himself, Attitudes, feelings & evaluation of self.
- Experience of both phenomenal or perceived self and Phenomenal or Perceived environment.

Self-concept is different from person to person, profession-to-profession, culture-to-culture & courses to courses etc. Praise & blame also has effect in changing the self-concept. Self-concept is important for learning, personality development & adjustment. It develops mental health of an individual.

Self-esteem: It is also another factor of personality development. When an individual fulfills his needs, his personality automatically changes. It also promotes good mental health & adjustment. Self-concept is personal whereas self-esteem is universal. Everyone needs self-esteem. Self-esteem means: self respect, self confidence, feelings of strength & adequacy.

Self-esteem is important for the development of self-concept. If a person's self-concept & self-esteem matches, he becomes a well adjusted person having a good personality.

Therefore parents & teachers should be very careful in providing the phenomenal environment for the better development of self concept of the individual. An individual should be absorbed in useful work which will keep him in touch with reality and enhance self-esteem. The teacher's task is all important in developing positive & healthy self-concept. The teacher should see that the children have learnt to set goals which are realistic and are in keeping with their ability to attain them. Otherwise unrealistic, over-ambitious goals will lead to frustration which will again lead to negative, unhealthy and antisocial self-concept which ultimately does great harm to personality development & adjustment. This will ultimately lead to disturbed mental health. It is important to have good mental health.

Maladjustments are the result of stress, tension, conflicts & frustration. It refers to disharmony between the person & his environment. A person becomes maladjusted when there is no balance between the needs & circumstances.

The important causes of maladjustment are: conflicts & frustration. When decisions are not taken during conflicting situation, it leads to frustration. A frustrated individual reacts towards himself & also to the society. A maladjusted individual is a liability to the society. Therefore prevention should be taken to make a person well adjusted instead of being maladjusted. Maladjustment can be prevented by two ways: Directly & Indirect Method of preventing maladjustment is also known as defense mechanism.

7.6 UNIT END EXERCISES

1. Explain the meaning & importance of self-concept.
2. Explain how self-concept & self-esteem helps in personality development.
3. Write short notes on:
 - a) Self-concept
 - b) Phenomenal environment
 - c) Self-esteem
4. Write any three characteristics of a maladjusted person.
5. Write two main causes of maladjustment.
6. What is maladjustment? Explain the different methods of preventing maladjustment.

7.7 SUGGESTED READINGS

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GROUP PSYCHOLOGY

Unit structure:

8.0 Objectives

8.1 Introduction- Meaning of Group, characteristics of Group, Types of Group.

8.2 Group Dynamics- Meaning, Process of Group Dynamics, Importance of Group Dynamics

- Check your Progress

8.3 Sociometry

- Check your Progress

8.4 Let us sum up

8.5 Unit End Exercises

8.6 Suggested reading

8.0 OBJECTIVES

- To develop an understanding of group dynamics.
- To develop an understanding of the process of group dynamics.
- To gain insight into the importance of group dynamics and group mind.
- To acquaint the learners with the Sociometric techniques.

8.1 INTRODUCTION

Introduction to Group Dynamics

Human beings exhibit some characteristic behavior patterns when interacting in groups. Therefore, understanding group behaviour plays a vital role in order to establish a harmonious society. The group helps a person in the satisfaction of his fundamental needs and in achieving a sense of accomplishment. In modern organizations, groups are employed as major instruments for operations, particularly for problem- solving and improving performance.

Meaning of a Group:-

It has been commonly observed and also established through various experimental studies that there are differences in the behaviour of an individual when they are alone and when they are together in a group. As a member of a group, he exhibits group behaviour. When two or more people come together it is known as a Group. A group is one in which people come together to attain a common goal & the relations among the members are interdependent i.e. each member's behavior influences the behaviour of the others in the group.

According to Mill, 'A unit composed of two or more persons who come together to achieve a specific purpose & consider a contact meaningful is a Group.'

Bass approached the definition of a group in the angle of motivation & satisfaction of needs.

Bogurdas defines a group as, "A collection of two or more persons with common interests, stimulating each other having common loyalty & participating in common activities."

Characteristics of a Group: A typical group must have the following essential characteristics in order to be called a group in the psychological sense.

1. **Leadership:** - According to Carter, a leader is a person who is able to lead the group towards the attainment of the goal. The teacher helps the students in the attainment of the goals. In that sense, the teacher is the leader of the classroom group.
2. **Interdependency/ Common Interest:** - The members of a group have common and well defined goals, interest and ideals. Every member tries to attain the goals set down by the society e.g. members of Rotary Club have a common aim of social work for the benefit of underprivileged. The behavior of one member of a group influences that of the other and in this way his own behavior is influenced. This type of relationship is also known as psychological relationship.
3. **Cohesiveness (Oneness):** - There is a sense of oneness in the group because of the similarity in interest. A member looks upon others as related to him. In this way, good feelings, devotion, faithfulness, adjustment, suggestion & imitation are developed amongst the members.
4. **Conformity (Comply by the rules set within the group):** - The members of the group have to adhere to the rules set by the group. The actions of members are controlled by the group.

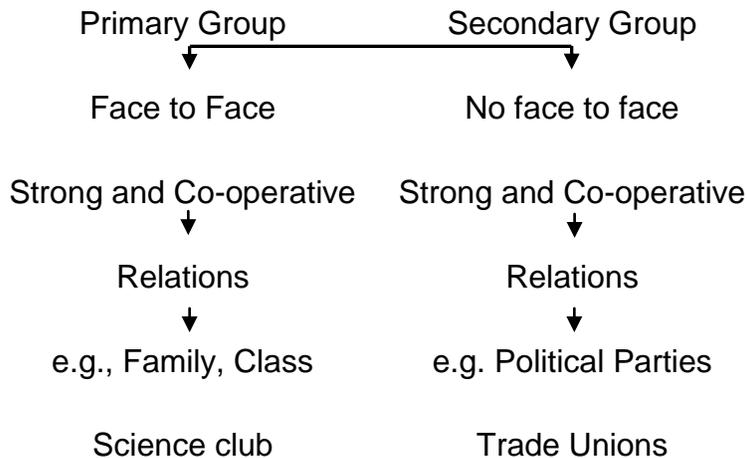
All the members of the group follow the ideals & traditions of the group.

5. **Organized structure:** - Any group has an organized structure which is well defined .e.g. The class is an organized structure which is homogeneous with respect to age, subject, etc.
6. **Motivation/ Mutual Obligation:** - The degree of motivation or the motivational level that exists among the members of the group should be the same. It is such a power as keeps not only the members of the group united but also provides them with energy e.g. the relationship between the children & parents in the family or the love of husband & wife. In spite of differences, they have certain common aims, ideals & values. We-feeling is developed leading to the development of affinity in the group. Social values are also developed.

TYPES OF GROUPS

There are different types of groups and they are ;

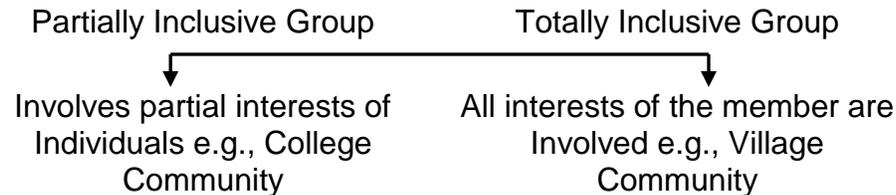
PRIMARY AND SECONDARY GROUPS :-



- **IN-GROUPS AND OUT-GROUPS :-** The members have common goal, common interest and a sense of we feeling. The members of in-groups treat others as outsiders. In groups may be either primary or secondary e.g., Family is an example of primary in-group. The nation towards which we feel love is an example of secondary in-group. The groups which are not in-groups are out-groups.
- **PURPOSIVE AND ACCIDENTAL GROUPS :-**
 - **PURPOSIVE GROUP :-** Permanent and organized – Main aim is to achieve definite goal e.g., Family, Church, School, Village Community.

- **ACCIDENTAL GROUP** :- Short-lived and Unorganised – Individuals gather by mere chance e.g., Railway compartments, Bus Stand.

□ **PARTIALLY AND TOTALLY INCLUSIVE GROUPS :-**



- **OPEN AND CLOSED GROUPS** :- Open groups are those groups in which everybody can become a member whereas closed groups are secret societies where membership is not open to all.
- **CROWD AS A GROUP** :- Crowd is a collection of people formed on the spur of moment. It has no permanent goals but only transitory aim. It is governed by emotions. Behaviour of the people is not normal in the crowd. They follow impulse of the moment. They think less and accept readymade conclusions.
- **CLUB AS GROUP** :- A club is a collection of people who meet in a planned manner not like crowd. The goals of the club are clearly defined. The club has a common interest, ideal or goal e.g., Science Club.
- **COMMUNITY AS GROUP** :- Community is more permanent than crowd or club. Individuals behaviour is controlled and regulated by the community. A community has its culture, art, literature and common social, political and economic bonds. Members of the community are emotionally attached, take keen interest in the activities of the community and obey its norms and traditions.

8.2 GROUP DYNAMICS

Meaning of Group Dynamics:

It is a relatively new concept in the socio – psychological field. Etymologically, the word, Dynamic, is derived from a Greek word, which means ‘force’. Thus, Group Dynamics stands for the forces operating in a group. A group is constantly interacting, thereby bringing about a perpetual change in the personality and behaviour of the members constituting the group. 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 phenomenon which emerge out of group interaction.

- According to the Good's dictionary – "Group Dynamics implies an interactive psychological relationship in which members of a group develop a common perception based on feelings and emotions. These inter-stimulative relationships may be described by the term Group Dynamics."
- Kretch & Crutch - Group Dynamics implies changes that take place within groups.

Thus group dynamics is the study of forces exerted by the group on the individual or the individual on the group.

Process of Group Dynamics: -

Argyle (1969) categorized 4 stages in the "life" of a group

- forming
- Storming
- Norming
- Performing

Heron (1989) identified a fifth stage

- Mourning / Adjourning

- Forming** - This is when a group first gets together. People tend to find out about each other, consider purposes, brainstorm ideas and possible structures for tasks and consider their own roles within the group. This is usually a very sociable time in the life of the group.
- Storming** - As the group begins to settle in and individuals get to know each other, they may start competing for status and role in the group. Disagreements occur and where some members may try to assert strong opinions or leadership tactics, others may withdraw. If tensions are not mutually dealt with at this stage, they tend to disrupt group communication and activity, and most importantly, mutual respect for the roles of members. To reach stages (c) and (d) conflicts need to be resolved.
- Norming** - After the more tense stage of storming, the group usually begins to settle as members have found a common approach to the task that all agree upon or accept (this is where unsettled conflicts can be problematic as they will probably reoccur later). Action plans begin to emerge and people find space to begin working on tasks.
- Performing** - This is the stage when the group achieves optimum efficiency and work gets done. At this stage it is

important to know the team work strategies you are working with (Sharples, 1999: 71) that will best utilize the expertise of each member. It is also useful to be aware of time spent on each task through a log or diary, so that possible conflicts do not reoccur.

- e) **Mourning / Adjourning** - Having satisfactorily got through the group tasks, if the group has been successful in working together, despite initial tensions and conflicts, we often see members sad to leave each other. This is where mutual respect and achievement is felt most significantly. Often sub-groups form from the larger groups to continue with personal or professional development interests.

Importance of developing Group Dynamics in Learning:

- 1) **To improve the behavior of students** - In a class room group, the students come into contact with each other and acquire appropriate type of education.
- 2) **To develop mental processes** - Some sort of exchange of thoughts goes on in the class group through which intellectual activities like reasoning, memory, judgments, decisions, thinking and imagination develop.
- 3) **To develop the feeling of self sacrifice** - The students in a class room group remain in close contact with each other. Therefore so much love, good will and sympathy develops in them that in the time of need they do not hesitate to sacrifice themselves for the sake of others.
- 4) **To prepare for future social life** - Children in class room group live together for pretty long time and try to adjust their thoughts, habits and view points to others. Such a type of experience prepares them for future social life.
- 5) **To excite sympathy of numbers** - A student starts doing as other students do. This tendency is called sympathy of numbers.
- 6) **To develop qualities of leadership** - Students in classroom groups plan or organize a number of co-curricular activities. Thus qualities of leadership are developed in them.
- 7) **To acquire more knowledge** - In a classroom group the students learn the habits of competition and imitation and get an inspiration to acquire more knowledge.
- 8) **To develop the feeling of co-operation** - The teacher encourages all the members of a classroom group to work together and thus feeling of cooperation is developed in them.

Check your progress

- 1) What is a Group? What are the basic characteristics of a group?
- 2) What is Group Dynamics? Why is it important for a teacher to know about the dynamics of a group?

8.3 SOCIOMETRY

Educational Psychology is the systematic study of applications of principles of psychology in education. It helps us to understand the behaviour of an individual as a whole. Sociometry is a technique in educational psychology to understand the behaviour of individual. It is based upon the study of behaviour of an individual within the group. It is necessary to see the individual the way he is seen by his fellow pupils to know his behaviour in detail.

Sociometry technique was devised by Moreno and adapted by Jenning for study of students in class-room situation. It is also known as sociogram.

MEANING OF SOCIOMETRY :-

John W. Best :- Sociometry is a technique for describing social relationships that exist between individuals in a group.

Bronfen Brenner :- Sociometry is the method for discovering, describing and evaluating social status, structure and development by measuring the extent of acceptance or rejection between individuals in groups.

The graphical representation of sociometry can be termed as sociogram. In the light of above definitions we can conclude that; Sociometry is the measurement of inter personal relationship prevailing among the group members.

TECHNIQUES OF SOCIOMETRY:-

There are two types of techniques of sociometry.

Guess Who Technique: The questions are asked to each pupils in the group e.g., With whom do you enjoy most in gatherings?. Whom would you like to sit next to you in the class?

Nominating Technique: The questions are asked to the Pupil in the group e.g., Name the star of the Class. Name the leader of your group.

First the Sociometric technique is selected, test is administered, data is collected, data is tabulated and interpretation is drawn on analyzing the collected data. We may represent the data in graphical form.

ADVANTAGES OF SOCIOMETRY:-

1. Sociometry helps in discovering the patterns of choice, rejection, attraction and repulsion among the individuals making up the group.
2. It facilitates the appraisal of the social adjustment of the individuals.
3. It helps in counselling in the area of social skills e.g., If the pupil is maladjusted in the group then counselling is done to improve adjustment.
4. It helps in identifying leaders, isolates, mutual-choice, representatives e.t.c.
5. It is useful to have an idea of a group at a glance.
6. It helps us to form appropriate groups of students for carrying out various activities and projects.
7. Sociometry helps us to understand the characteristics of an individual who is liked or disliked by the group. It also assists us in knowing the qualities of leadership as being appreciated by a particular group.

EDUCATIONAL IMPLICATIONS:-

1. The teacher should try to develop group consciousness in the students.
2. School authorities should impart moral and religious teaching through collective instruction. e.g., Celebrating festivals and important days.
3. Education for patriotism and citizenship should be imparted in the collective gatherings of students.
4. Group techniques should be used to teach intellectual subjects i.e., discussions, seminars, group projects etc.
5. Aesthetic subjects such as art, music and poetry should be taught in higher classes.
6. National days, sports week, festivals etc., should be celebrated to develop social qualities among the students.

7. Competitions and tournaments should be organized to develop sportsmanship and leadership.
8. Training should be given to the students in social living.
9. Teacher should present himself / herself as an example to be followed.
10. Pupils should be motivated to participate in group activities.

To conclude a teacher must have knowledge of process of interaction among students coming from different socioeconomic backgrounds. A teacher well equipped with knowledge of group dynamics can provide better guidance for adjustment & improve emotional and social climate of the class. He can find out causes for conflict, rivalry, fear or anxiety in the group which leads to disturbance in learning process. Based on this he can take remedial measure to maintain conducive environment in the class. Thus intra group relation can be improved & mental health of individual members can be maintained.

Check Your Progress

1. What is Sociometric technique? Explain its Advantages
2. Explain the meaning and different techniques of sociometry

8.4 LETS SUM UP

- A group is a collection of people having common goal and sense of oneness and group dynamics refers to the forces exerted by group on the individuals and by individual on the group.
- A group is characterized by the following – sense of oneness, common goal, similarity of behaviour, psychological relationship, influence of group characteristics, control of the group, mutual obligation, feeling of unity and mutual expectations.
- The different types of group are: Primary & Secondary group, In-group & out-group, Purposive & Accidental group, Partially & Totally inclusive group and Open & Closed group. Even Crowd, Club and Community are forms of groups.

- Sociometry is a technique for describing social relationships that exist between individuals in a group. The two techniques of sociometry are: Guess Who technique and Nominating technique. Sociometry helps us to know the group at a glance.
- Through a number of ways a teacher can foster and motivate the group feeling in his students.

8.5 UNIT END EXERCISES

1. Explain the meaning and process of group dynamics
2. What is group dynamics? Discuss its importance
3. Describe the process of group dynamics
4. Explain the importance of developing group dynamics in learning.
5. Explain the meaning sociometry with its educational implications.

8.6 SUGGESTED READING

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PRACTICALS A & B -SECTION I & II (Experiments to be conducted) (Self Guided)

Unit Structure

- Objectives
- Introduction
 - A) PRACTICALS (SEMESTER III)**
 - i. Learning Curve
 - ii. Transfer of learning (Mirror drawing)
 - iii. Motivation
 - iv. Distraction of Attention
 - v. Division of Attention
 - vi. Perception
 - B) PRACTICALS (SEMESTER IV)**
 - i. Concept Formations
 - ii. Lateral Thinking
 - iii. Memory-Recall and Recognition
 - iv. Memory - Rote and Logical
 - v. Sociometry
 - vi. Creativity

• Objectives

After going through this unit you will be able to:

- i) Understand the significance and the educational implications of the experiments.
- ii) Understand the importance of Learning Curve
- iii) Understand the significance of Transfer of learning (Mirror drawing)
- iv) Explain the Distraction of Attention and Division of Attention
- v) Understand the significance of Perception
- vi) Understand the importance Concept Formations
- vii) Understand the importance and significance of Lateral Thinking
- viii) Understand the importance Memory-Recall and Recognition

Introduction

The remarkable achievements made by the physical sciences are mainly due to observations made under controlled conditions. The experimental technique has come to form an essential part of every branch of science. Psychology is becoming

more and more objective, following the footsteps of the physical sciences. There are many experiments related to experimental psychology. In this unit, we shall describe only a few common experiments conducted in psychological laboratories.

In describing the experiments in the following pages, letters, “E” and “S” will be used to denote the words *experimenter* and *subject*.

In group experiments, the instructor will work as “E” and the group will work as “S”, while in individual experiments, the students will work in pairs. While performing experiments the experimenter and the subject should follow some rules.

General Rules to be observed in doing a Psychological Experiment

The Experimenter

- (i) Aim of the experiment should be clearly understood.
- (ii) Method once decided upon should be adhered to rigidly.
- (iii) ‘E’ should not puzzle the ‘S’.
- (iv) ‘E’ should not express surprise or disappointment at what ‘S’ does.
- (v) Observations should be recorded as objectively as possible.

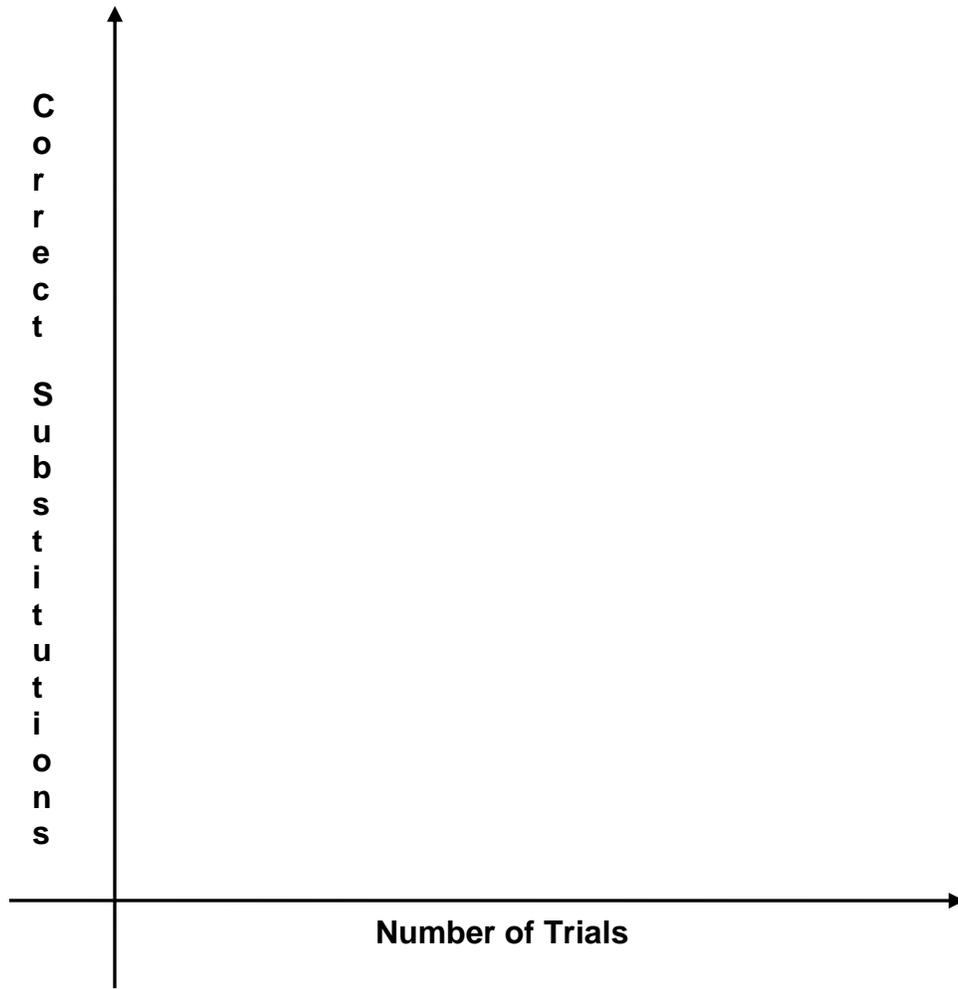
The Subject

- (i) The individual who is acting as the subject should approach the investigation with a proper attitude.
- (ii) The experiment is useless if the subject comes prepared to expect certain results.
- (iii) The ‘S’ must be an active participant.
- (iv) The ‘S’ should take interest in the experiment and should have concentration in the work.
- (v) ‘S’ should not look upon an experiment as a competition with other members in the class.
- (vi) ‘S’ must clearly understand that the variations in ability, sensitivity, aptitude etc. are natural, and that they are discovered through psychological experiment.

What to record

- (i) Day, Date, Time, Serial No. of the experiment.
- (ii) Name of the subject and experimenter
- (iii) Aim of the experiment.
- (iv) Name of the apparatus/ material used.

The Learning Curve



Results:

Introspective Remarks:

Educational Implications:

Experiment 2 : Transfer of Learning

Aim: To study the transfer of learning in the given task.

Nature: It is an individual, paper and pencil performance test.

Material and Apparatus:

- A Cup and Ball set
- Paper and pen

Procedure: The experimenter created rapport with the subjects, stated the aim of the experiment and motivated the subjects to do their best. The subjects were asked to work in pairs. Each subject was instructed to try to move the ball into the cup by a flipping movement of the wrist. The subject's partner marked each trial of the subject, in the following manner: The subject plotted the results of the Trial and Learning in 'other' hand in the line-graph. The numbers of flips were plotted on the horizontal axis. The point/s gained for each flip of the 'the Other Hand' (the 3rd row of observations, after the transfer of learning occurred, from the Dominant Hand to the Other hand); were plotted on the vertical axis.

Observation Table:

Results of flipping the ball into the cup	Points
The ball does not touch the cup at all	0
The ball just touches the rim / edge of the cup	1
The ball lands in the cup, but falls out again	2
The ball lands in the cup and remains there	3

The subject entered results, in a table for Transfer of Learning in the 'Other' hand to record the point/s gained in each flipping action.

Flip No	1	2	3	4	5	6	7	8	9	10	Total
The Other Hand											
The Dominant Hand											
The Other Hand											

Experimental Results:

(a) The Graph showing Transfer of Learning to the Other Hand : No. of Trials (Attempts to flip the ball into the cup)



(b) The Kind of Transfer: The subject experienced a _____ transfer, from the Dominant Hand to the Other Hand.

Introspection :

How you felt before you started this experiment. How you felt during the experiment. Your opinions about observing your partner's performance: did it motivate you to perform better? Your feelings about your performance. Your opinions about the factors that influenced your performance (mental, physiological, emotional, etc.) Do you agree with your results, regarding this experiment?

Educational Implications :

Experiment 3 : Motivation

Aim: To study the effect of motivation on academic performance.

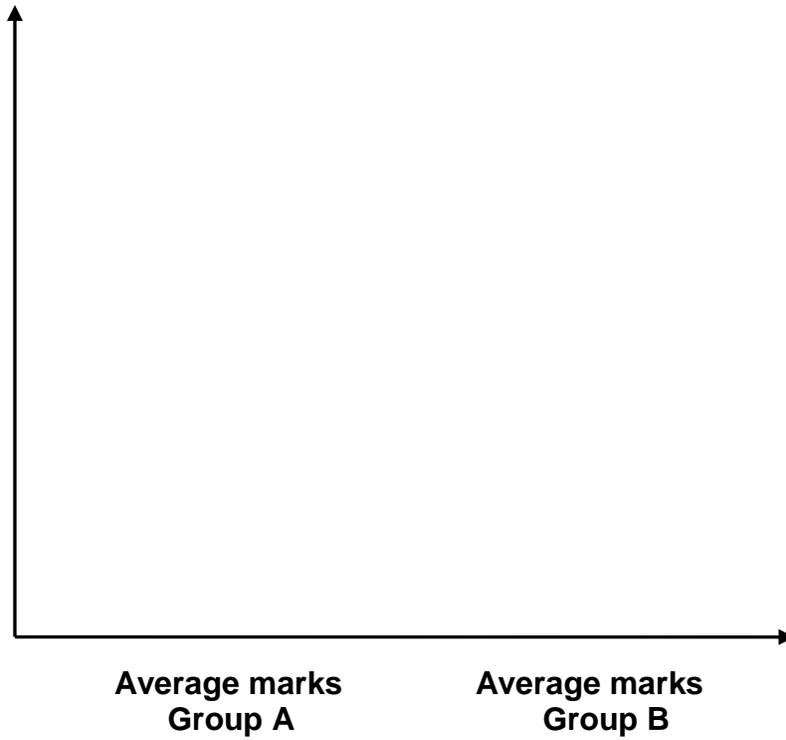
Apparatus: Numerical Aptitude Test, pen/pencil and a stopwatch.

Nature: It is a verbal, individual, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best. The class was randomly divided into two groups. Students in Group A were given a Numerical Aptitude Test. Students in Group B were given the same Numerical Aptitude Test, with a very motivating message and promise of reward for high achievement. The answers were scored and test results were tabulated. A percentage bar graph was drawn with Group results on the X-axis and Achievement on the Y-axis. Results were analysed and the introspection and educational implications were written.

Observation Table:

Results of the Numerical Aptitude Test	Average marks
Group A: Test sheets printed with the Extrinsic Motivator	
Group B: Test sheets without the Extrinsic Motivator	



Introspection :

How you felt before you started this experiment. How you felt during the experiment. Your opinions about your performance: did it motivate you to perform better? Your feelings about your performance. Your opinions about the factors that influenced your performance (mental, physiological, emotional, etc.) Do you agree with your results, regarding this experiment?

Educational Implications :

Experiment 4 : Distraction of Attention

Aim : To study the effect of a distraction on the subject's attention, during the given task.

Apparatus: A Letter Cancellation Sheet, a pen/pencil and a stopwatch.

Nature: It is a verbal, individual, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best. This experiment had three parts.

1. In the first task, the subjects were asked to cross out the letters ' A, E, K and S' on the Letter Cancellation sheet, for exactly 30 seconds. An oblique mark was made to enable counting of the cancelled letters in the given time period. This task was repeated twice.
2. In the second task, a mild sound distraction was introduced by playing soft instrumental music, while the subjects crossed out the letters ' A, E, K and S' on the Letter Cancellation sheet, for exactly 30 seconds, thrice.
3. In the third task, a strong and loud sound distraction was introduced by playing loud music and clanging sounds, while the subjects crossed out the letters ' A, E, K and S' on the Letter Cancellation sheet, for exactly 30 seconds, thrice. At the end of the procedure, the subjects were asked to record the total correct cancellations and to calculate the average scores for each part of the experiment. The results of the individual scores

and class highest / lowest scores were recorded in an observation table, as given below :

OBSERVATION TABLE		
(1) Letter cancellation in comparative silence	(2) Letter cancellation while instrumental music or songs are played	(3) Letter cancellation along with loud conflicting sounds
Individual Score	Individual Score	Individual Score
Highest Class Score	Highest Class Score	Highest Class Score
Lowest Class Score	Lowest Class Score	Lowest Class Score

(5) A joint bar graph was plotted to show the varied results of the class and the individual.

Experimental Results:

(c) The Graph showing effects of Distraction of Attention :



Results: The subject is able to complete the activity of cancelling letters A,E,K,S; along with music and loud disturbing sounds as major distractants; with speed and efficiency; as effectively, as she had done, when the cancellation tasks was done in relative silence.

Introspection:

How you felt before you started this experiment. How you felt during the experiment. Your opinions about your performance: did it motivate you to perform better? Your feelings about your performance. Your opinions about the factors that influenced your performance (mental, physiological, emotional, etc.) Do you agree with your results, regarding this experiment?

Educational Implications:

Experiment 5 : Division of Attention

Aim: To study the possibility for division of attention, on two mental activities at the same time.

Apparatus: Paper, pen/pencil and a stopwatch.

Nature: It is a verbal, individual, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best. The experiment consisted of 3 parts.

(1) *Mental activity.* The subjects were asked to write down odd numbers from 1 to 99 in serial order, and all over again, for a period of 2 minutes. The total odd numbers were counted.

(2) *Writing activity.* The subjects were asked to write the alphabets A to Z, and all over again , in serial order, for a period of 2 minutes. The total alphabets were recorded at the end of time.

(3) *Mental and Writing activity.* The subjects were asked to silently count odd numbers 1 to 99, and simultaneously write down the alphabets A to Z. This double task was performed for 2 minutes. The subjects were asked to immediately record the total odd numbers silently counted. They were ten asked to count and record the total alphabets at the end of the line.

(4) The observations were recorded, as results of the individual scores and class highest and class lowest scores were recorded.

OBSERVATION TABLE		
(1) (Muscular) Writing activity	(2) Mental activity	(3) Simultaneous Mental and (Muscular) Writing activity
Individual Score	Individual Score	Individual Score
Highest Class Score	Highest Class Score	Highest Class Score
Lowest Class Score	Lowest Class Score	Lowest Class Score

Experimental Results: The Joint Bar Graph showing the varied results of Division of Attention in the individual and the class.



Results: The subject is able / unable to complete the task of simultaneously counting and writing activities, with speed and efficiency; as effectively, as s/he had done, when the individual tasks were done alone.

Introspection:

Speed: Comment on how quickly / slowly you could write in the third task, of simultaneous counting and writing.

Efficiency : Comment of how accurately and quickly you can / cannot complete two tasks at the same time.

Concentration: Comment on how well you could concentrate on one of both jobs, as demanded in the third task.

Application: Comment on your ability to apply your mind, energy, and body to completing both tasks at the same time.

Motivation: Comment on the internal and external motivation that helped or energized you to perform well at the simultaneous jobs, in their task.

Mental Agility: Comment on your mental speed and energy that enabled you to perform well at the simultaneous jobs, in their task.

Educational Implications :

Experiment 6 : Perception

Aim: To study the change in perception due to change in perspective.

Apparatus: Figures in reversible perspectives

Nature: Group, verbal, paper-pencil

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated them to do their very best. The experimenter started exposing the figures one by one each for a 2 minute period. Subjects were told to observe each figure carefully and note the way in which the two patterns alternate. They were told to note how long they could look at each figure from one perspective. This was done with each of the reversible figures.

Result:

	Figure	Ground	Remarks
Vase-Face figure			
Reversible block			
Cube			
Young-Old women			

Introspective Remarks:

Conclusion: The ‘figure’ seems to stand out in the front while the ‘ground’ appears to extend behind the figure. Figure is more compact and well-shaped. It has form while the ground is a shapeless mass. Figure is more impressive and lively and is remembered better. Perception is selective. So we tend to select ‘figure’ and ‘ground’ according to our perspective.

Educational Implications :

Educational Implications:

Experiment 8 : A Lateral Thinking Test

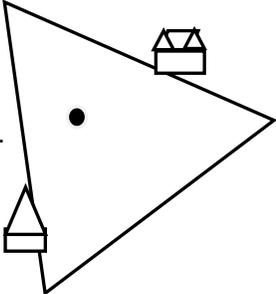
Aim: To find out the extent of lateral thinking.

Apparatus: Paper, pen/pencil and a stopwatch.

Nature: It is a verbal, group, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best. The experiment consisted of 3 parts.

(1) *Mental activity.* The subjects were asked to solve 10 problems individually, and record their answers, in the column provided

<u>Problems for Lateral Thinking</u>	<u>Answers</u>
<p>1. The dot inside the triangle is Shilpa on her way to school.</p> <p>There is a sudden thunderstorm. Since time is of the essence, would it be faster for Shilpa to run back home ? Why ?</p>  <p>2. Removing an appendix is called an appendectomy, removing tonsils is called a tonsillectomy. What is it called when they remove a growth from your head?</p> <p>3. How could a person fall out of a twenty-story building onto the ground and still live?</p> <p>4. What three things that you can eat can never have for breakfast?</p> <p>5. If a farmer raises wheat in dry weather, what does he raise in wet weather?</p> <p>6. What would you call a person who did not have all his fingers on one hand?</p>	<p>1. _____ _____ _____ _____ _____</p> <p>2. _____</p> <p>3. _____ _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p>

7. There are six eggs in the basket. Six people each take one of the eggs. How can it be that one egg is left in the basket?	7. _____ _____
8. How could a man be severely injured, after being hit by some tomatoes?	8. _____
9. Why do Chinese men eat more rice than Japanese men?	9. _____
10. A black dog stands in the middle of an intersection in a town painted black. None of the street lights work, due to a widespread power failure caused by a local storm. A car with two broken headlights drives towards the dog, but turns in time to avoid hitting him. How could the driver have seen the dog in time?	10. _____ _____

The observations were recorded. The results of the individual scores and class highest / lowest scores were recorded.

Results: Total problems given **10**

Total problems solved correctly _____

Introspection:

Conclusions:

Educational Implications:

Experiment 9 : Memory (Recall and Recognition)

Aim: To measure the amount of retention of a given method or material, by :

(a) the method of recall and (b) the method of recognition.

Apparatus: A Paper, pen/pencil and a stopwatch.

(A) A Learning list of 20 words

(B) A Recognition list of 80 words, which includes a random arrangement of all words from list (A).

Nature: It is a verbal, group, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best.

In the method of recall, the experimenter distributed the list (A) to the subjects. They were instructed to read the words for one minute, turn the list over, and close their eyes and rest for one minute. This part was repeated twice. Later the subjects were asked to recall as many words as were possible, and write them down in random order in their journal. The number of correctly recalled words was counted and the percentage of the recall score was calculated.

In the method of recognition, the experimenter instructed the subjects to put list (A) away, and then distributed list (B) to them. They were asked to recognize as many words from list (A) , present in list (B), and circle them with a pencil. The correctly recognized words were counted and the percentage of the recognition score

was calculated. The observations were recorded. The results of the individual scores and class highest / lowest scores were recorded. A joint bar graph was plotted to show the varied results of the class and the individual.

Observations :

Words Recalled:

Words Recognised:

Results of the Experiment:

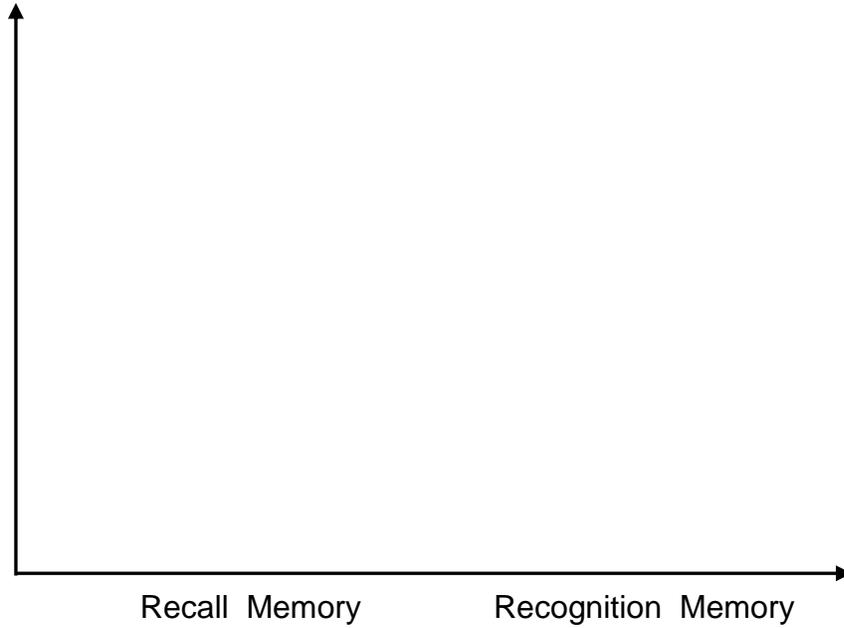
Method of Recall :

Individual score:	
Lowest Class score	
Highest Class score	

Method of Recognition :

Individual score:	
Lowest Class score	
Highest Class score	

A Joint Bar Graph is plotted to show the varied results of the class and the individual:



Introspection:

Conclusions:

1. My ability to recall is lower than / higher than the class lowest ability
2. My ability to recognise is lower than / higher than the class lowest ability
3. My ability to recognize is better than / is as good as my ability to recall
4. In my experimental group, ___ students recalled 100% , while ___ students recognized 100% of the given words.

Educational Implications:

Experiment 10 : Memory (Rote and Logical)

Aim: To study the effect of memory on retention.

Apparatus: (A) A List of 20 random nonsense-syllable words,
(B) A List of 20 disconnected words,
(C) A List of 20 connected words and
(D) A complete Sentence of 20 words.
Paper, pen/pencil and a stopwatch.

Nature: It is a verbal, group, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best. The experimenter read out the **List (A) containing 20 nonsense-syllable words**, at a slow and even pace; thrice, pausing for 5 seconds between each reading. At the end of the third reading the subjects were asked to silently count the numerals 1 to 100, for two minutes, to prevent the subject thinking about the words. Thereafter they were permitted 2 minutes to write down as many nonsensical words as they could remember.

The same procedure was repeated for **List (B) containing 20 disconnected words**. After 2 minutes of silent counting, the subjects were asked to write as many down as many disconnected words as they could remember, for a writing period of 2 minutes.

The same procedure was repeated for **List (C) containing 20 connected words**. After 2 minutes of silent counting, the subjects were asked to write as many connected words as they could remember, for a writing period of 2 minutes.

The same procedure was repeated for **the Sentence containing 20 words**. After 2 minutes of silent counting, the subjects were

asked to write the sentence in perfect word- order, for a writing period of 2 minutes. After completing all four parts of the procedure, the subjects counted the correct words for each list, and tabulate their results in the journal. The observations were recorded. The results of the individual scores and class highest / lowest scores were recorded. A joint bar graph was plotted to show the varied results of the class and individual.

Observations :

Random Nonsense-Syllable Words :	Random Disconnected Words :

Random Connected Words :	A Sentence Containing 20 Words :

Results of the Experiment:

Nonsense-Syllable Words :

Individual score:	
Lowest Class score	
Highest Class score	

Disconnected Words :

Individual score:	
Lowest Class score	
Highest Class score	

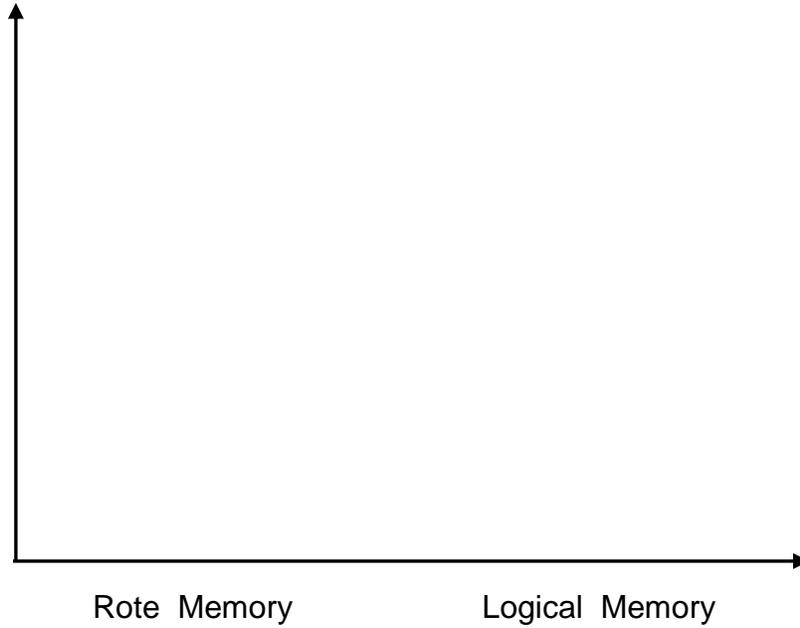
ConnectedWords :

Individual score:	
Lowest Class score	
Highest Class score	

A Sentence of 20 Words :

Individual score:	
Lowest Class score	
Highest Class score	

A Joint Bar Graph is plotted to show the varied results of the class and the individual:



Introspection:

Conclusions:

1. My Rote Memory is lower than / higher than the class lowest ability
2. My Logical Memory is lower than / higher than the class lowest ability
3. My Logical Memory is better than / is as good as my Rote Memory

Educational Implications:

Experiment No. 11 A Creativity Test

Aim: To assess the creative ability of undergraduate students.

Apparatus: Baqer-Mehdi's Test of Creativity work-sheet, stopwatch.

Nature: Verbal and Non-Verbal, group, paper-pencil.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the students to do their very best. The experimenter distributed the work-sheets and instructed the subjects to respond to the given test items, in the specified time frame.

1. The **Consequences Test:** (Time allowed is 10 minutes):
Think of as many consequences as is possible for the following situations:

a) What would happen if humans could fly like birds?

b) What would happen if our schools had wheels?

c) What would happen if humans did not have any need for food?

2. The **Unusual Uses Test**: (Time allowed is 10 minutes):

Write as many novel, interesting and unusual uses for the following objects:

(a) A piece of stone:

(b) A wooden stick:

(c) Water:

3) The **New Relationship** Test: (Time allowed is 10 minutes):
Write as many relationships, as is possible, between:

(a) Tree, House:

b) Chair, Ladder:

c) Air, Water:

4) The **Product Improvement** Test: (Time allowed is 5 minutes):
Suppose you start with a toy horse. Write as many new features, properties or things to make it more useful and interesting:

5) The **Picture Completion** Test: (Time allowed is 10 minutes): Using a semicircle and a rhombus, you have to construct elaborate pictures, using each figure. Write an appropriate title for each picture:

6) The **Line Figure Completion** Test: (Time allowed is 10 minutes): Given ten incomplete line drawings, you have to draw meaningful and interesting pictures, using each line drawing. Write an appropriate title for each picture:

7) The **Picture Completion** Test: (Time allowed is 10 minutes): Given seven triangles and seven ellipses, you have to construct meaningful and interesting pictures, by using these figures, in multiple associations. Write a title for each picture:

Introspection:

Educational Implications:

Experiment No. 12 Sociometry

Aim: To draw a Sociogram of the student's group

Apparatus: Paper, pen/pencil.

Nature: It is a non-verbal, group, paper and pencil test.

Procedure: The experimenter created a rapport with the class, stated the aim of the experiment and motivated the subjects to do their best.

The subjects were instructed to draw a sociogram in the following manner:

1. The subject drew a circle in the centre and wrote her/his name inside it.
2. The subject drew 10 circles in the space around the primary circle.
3. The subject was instructed to draw 4 different arrows between each circle and the primary circle, depending on the relationship between them.

Result: The Sociogram was analysed by counting the number of :

- a) Strong unidirectional arrows
- b) Strong bi-directional arrows

Conclusion :

Introspection:

Educational Implications:

Out-group

