

**DIRECTORATE OF DISTANCE EDUCATION  
UNIVERSITY OF JAMMU  
JAMMU**



**SELF LEARNING MATERIAL  
B. A. SEMESTER - IV**

**SUBJECT : EDUCATION**

**UNIT : I-V**

**COURSE CODE : ED-401**

**LESSON NO. : 1-19**

**Dr. Hina S. Abrol**  
Course Co-ordinator

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## PSYCHOLOGICAL FOUNDATIONS OF EDUCATION

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### Course Contributors :

- **Prof. S.C. Gakhar**
- **Dr. Jaspal Singh**
- **Puneet Kour**
- **B.D. Damral**

### Content Editing :

**Dr. Jaspal Singh**  
Directorate of Distance Education  
University of Jammu, Jammu.

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## **EDUCATION**

### **Semester IV**

**(For the examination to be held in the year 2016, 2017 & 2018 onwards)**

**Course No. : ED-401 (Theory)**

**Title: Psychological Foundations of Education**

**Duration of Exam.: 3 Hrs.**

**Total Marks: 100**

**Theory Examination : 80**

**Internal Assessment : 20**

#### **Objectives of the course:**

To help the students to :

Understand concept of educational psychology and its objectives.

Understand the methods of studying human behaviour.

Understand the process of human growth and development through different sequential stages with reference to various changes and educational provisions.

Acquaint students with various types of special children and educational provisions for these children.

Understand the concept, types and bases of motivation.

Understand the concept of adjustment and mechanisms of adjustment.

Understand the concept of personality, its development and techniques of assessment of personality.

Acquaint themselves with use of statistics in Education in terms of use and computation of statistical measures like variability, percentiles and correlation.

#### **UNIT-I**

##### **Educational Psychology and Methods of Studying Behaviour**

Concept of educational psychology, objectives of studying educational psychology,

**Methods of studying human behavior**

**Introspection** - Meaning and definitions, process involved in introspection, merits and limitations of the method.

**Observation** - Meaning and definitions, types -controlled and uncontrolled, steps involved during observation, merits and limitations.

**Experimental** - Meaning and definitions, characteristics, steps involved in experimental method, merits and limitations.

### **Stages of Human Growth and Development**

Infancy, childhood and adolescence with special reference to physical, intellectual, emotional and social changes, educational provisions for different stages.

## **UNIT-II**

### **Special Children, Categories and Educational Provisions**

#### **Special Children**

Concept, Types.

#### **Gifted and Creative Children**

Meaning and definitions, difference between gifted and creative children

Characteristics of gifted children, identifying gifted children, educational provisions for the gifted children.

#### **Delinquent Children**

Concept, causes responsible for delinquent acts among children

Measures to prevent and treat delinquent children.

## **UNIT-III**

### **Motivation and Adjustment**

Concept: Types of motivation (intrinsic and extrinsic), Bases of motivation-needs (physiological and psychological) and drives

**Adjustment:** Concept, mechanisms of adjustment; rationalization and sublimation

## UNIT-IV

### **Personality**

Concept & Types of personality

Assessment of Personality

**Subjective Techniques** (Anecdotes, Autobiography, Case Study)

**Objective Techniques** (Controlled Observation Structured Interview and Rating Scale)

**Projective Techniques** (Thematic Apperception Test-TAT, Rorschach Inkblot Test)

## Unit- V

### **Statistics and Its Use in Education**

Measures of Variability: concept of measures of Variability, concepts and calculation of Range.

Quartiles, Quartile Deviation (Q.D.), Mean deviation and Standard Deviation.

**Percentiles and Percentile Rank:** concepts and calculation of percentiles and percentiles rank.

Correlation: Concept of correlation, computation of coefficient of correlation of ungrouped data by Rank Difference method (Spearman's method) and Product Moment (Karl Pearsoll's method)

### **Question Paper Setting**

The question paper would contain two types of questions, that is, **Long Answer Type Questions and Short Answer Types Questions.**

There would be **two long answer type questions**, set from each unit; out of which one question will have to be attempted by the students, **unitwise.**

Similarly, there would be **two short answer type questions**, set from each unit. The student will have to attempt **one short answer type question** from each unit. In all, students will have to attempt **five long answer type questions** and **five short Answer type questions** out of five units.

Long answer type questions would carry **Sixty marks for five questions (12 marks, each question)**; and

Short answer type questions would carry **Twenty marks** for five questions (**4 marks, each question**). These questions would be set **unitwise** in the question paper, separately (**Answer to short answer type question should not be more than too words, each question**).

### **Internal Assessment (Total Marks: 20)**

20 marks for theory paper in a subject reserved for internal assessment shall be distributed as under:

Two Written Assignments : 20 marks

### **Books Recommended**

1. Aggarwal, J.c. (2001): Essentials of Educational Psychology. New Delhi: Vikas Publishing House..
2. Bhatia, H.R. (1968): Elements of Educational Psychology. 3rd Edition, Calcutta, Orient Longman.
3. Bhatnagar, Suresh (2001). Advanced Educational Psychology. Meerut: R. Lal Book Depot.
4. Bower, Gordon and Hillgard, R. Earnst (1986): Theories of Learning Eastern Economy Ldition New Delhi: Prentice Hall of India.
5. Carlson, Neil, R. (1996): “Psychology: The Science of Behaviour” New York: Allyon anu Bacon.
6. Chauhan, S.S. (1978): Advanced Educational Psychology. New Delhi: Vikas Publishing House Pvt Ltd.
7. Dutt, N.K. (2003). Psychological Foundations of Education. New Delhi: Doaba House.
8. Garett, H.E. (1979): Statistics in Psychology and Education. Bombay, Vakils, Feffer and Simons Ltd.

9. Guiford JP Fruchter Benjamin (1978) : Fundamental Statistics in Psychology and Education Singapore: McGraw Hill Company.
10. Hurlock, B. Elizabeth (1981). Developmental Psychology - A Life Span Approach, New Delhi TATA McGraw Hill.
11. Kuppaswamy (1988). Advanced Educational Psychology. New Delhi: Sterling Publishers.
12. Kulshreshtha, S.P. (2001). Educational Psychology. Meerut: R. Lal Book's Depot.
13. Mangal, S.K. (1999): Advanced Educational Psychology. New Delhi: Prentice Hall or India Pvt. Ltd
14. Morgan, C.T. (1961). An Introduction to Psychology. New York: McGraw Hill.
15. Sharma, R.A. (2001). Fundamentals of Educational Psychology. Meerut: R. Lal Book Depot.
16. Sharma, R.N. (1987). Advanced Educational Psychology. Meerut: Rastogi Publications.
17. Verma, L.K. and Sharma N.R. (2007). Statistics in Education and Psychology. Jalandhar : Narindra Publications.
18. Woolfolk, Anita (2004). Educational Psychology. 2004 Ninth Ed Indian Reprint Edition (2005) New Delhi: Pearson Education Inc.

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**CONCEPT OF EDUCATIONAL PSYCHOLOGY. OBJECTIVES OF STUDYING EDUCATIONAL PSYCHOLOGY.**

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**Structure**

- 1.1 Objectives
- 1.2 Introduction
- 1.3 Meaning of Education
- 1.4 Meaning of Psychology
- 1.5 Meaning of Educational Psychology
  - 1.5.1 Definitions of Educational Psychology
- 1.6 Objectives of Studying Educational Psychology
- 1.7 Let Us Sum Up
- 1.8 Model Examination Questions
- 1.9 Suggested Readings
- 1.10 Answers to Check Your Progress.

**1.1 OBJECTIVES**

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

- (i) Explain the concept of term 'Education'.
- (ii) State various definitions of 'Psychology' in precise terms.

- (iii) Elaborate the concept of 'Educational Psychology'.
- (iv) Establish relationship between Education & Psychology.
- (v) Describe objectives of studying Educational Psychology.

## **1.2 INTRODUCTION**

Dear students, the purpose of this unit is to acquaint you with the terms 'Education', 'Psychology' and 'Educational Psychology'. The term 'Education' stands for the process of techniques of the development of the inborn potentialities and capacities in a child. It is a subject designed to help in the process of manifestation of natural talents of children within the limitations imposed by genetic factors. On the other hand 'Psychology' is a branch of human knowledge which helps in proper understanding of potential talents and capacities of the child as well as his desires, tastes, aptitudes, the process of learning and habit formation. 'Educational psychology' is a branch of psychology in which we try to apply the knowledge of psychology in various educational situations. We shall also learn about various objectives of studying educational psychology.

## **1.3 MEANING OF EDUCATION**

Education stands for modification of behaviour through a process of learning. This process starts in the life of a psycho-physical organism right at the time of birth. Every human organism is equipped with gateways of knowledge or sensory organs which starts their functioning right from the birth. Every individual is equipped with certain potentialities by nature. Education is a process which operates in the life of an individual to develop and manifest those potentialities to the maximum possible extent. In this regard we can compare an individual with a seed. Just as a seed possesses various capacities i.e. to bear leaves, flowers, fruit etc. Similarly, an individual possesses power of memory, intelligence, imagination, creativity, emotional energy and so on. Just as a gardner provides proper soil, manure, water etc. to a seed to develop into a full fledged tree, in the same manner through the process of education, society tries to bring about the manifestation of all the inborn/ intrinsic potentialities and capacities of an individual into the open. Education is a process which widens mental horizon, makes a man progressive, objective and develops in him sensibilities.

In other words, education is the process of fullest development of human personality through a continuous process of learning (through interaction with environment) modification, adjustment and readjustment with the changing environment scenario.

#### **I.4 MEANING OF PSYCHOLOGY**

In this age of science and technology, psychology has been considered as one of the youngest yet one of the most influential sciences. Curiosity in man has led him to know his surrounding which mainly include nature and other fellow men. There is always a desire to 'know' what 'one is' what is his background, what is it made of, what are the associated factors and in what way can it be useful to oneself? Each question will lead to more questions. Psychology tries to answer many of the questions we have about ourselves, other people and the nature of human life. Psychology has its formal beginning when Wilhelm Wundt established his psychological laboratory in Leipzig Germany in 1879. But in real sense, interest in psychology as a discipline date back to the work of Plato, Aristotle and other Philosophers.

Psychology is the systematic study of behaviour and mental processes — and the factors that influence them. The field of psychology has a dual mission (i) to understand behaviour and mental processes and (ii) to predict their course. Etymologically, it is composed of two Greek words "Psyche" and "Logos" means soul and science respectively. In modern times psychology is considered the scientific study of all the activities of the organism in relation to his environment. Study of behaviour covers all the three aspects — cognitive, affective and conative. Behaviour includes the entire range of human activity — thoughts, feelings and actions. It includes external as well as inner experiences of the organism.

#### **I.5 MEANING OF EDUCATIONAL PSYCHOLOGY**

Dear students, so far, we have discussed meaning of education and psychology separately as the term educational psychology is the combination of words – education and psychology. Here we shall discuss meaning of educational psychology as a separate discipline.

Educational Psychology is a compound word which is related with the application of psychological findings in the field of education. Both the terms – ‘Education’ and ‘Psychology’ are complementary to each other. Educational psychology is the science of education which mainly deals with the problems of teaching and learning and helps the teacher in his task of modifying the learner’s behaviour and bringing about an all round development of his personality. The subject matter of educational psychology consists of the accumulated and systematized results of observations and experiments in the laboratory, classroom and clinic of the educational psychologist and of all relevant contributions from all other sources such as educational sociology, general and applied psychology, experimental education, social psychology, developmental psychology, clinical and abnormal psychology and the life. Educational psychology helps the teacher to understand his pupils, whose education or training is his responsibility. It gives him confidence to deal with his pupils and the ability to control and manipulate the teaching methods and materials.

### **1.5.1 DEFINITIONS OF EDUCATIONAL PSYCHOLOGY**

Educational Psychology is a behavioural science with two main referents – human behaviour and education. Here is an attempt to make the meaning of educational psychology more clear with the help of some important definitions given by experts in this field.

1. **Crow and Crow**, “Educational psychology describes and explains the learning experiences of an individual from birth through old age.”
2. **W.B. Kolesnik**, “Educational psychology is the application of the findings and theories of psychology in the field of education.”
3. **J.M. Stephen**, “Educational psychology is a systematic study of educational growth.”
4. **C.E. Skinner**, “Educational psychology utilizes those that deal specially with the experience and behaviour of human beings in the educational situation.”
5. **Stout**, “The basic principle which psychology lends to the theory of education is that new knowledge should be a development of previous knowledge.”

6. **C.F. Good**, “Educational psychology is (i) the investigation of the psychological problems involved in education, together with the practical application of psychological principles to education (ii) a study of nature of learning.”

On the basis of above definitions following points can be enumerated :

- (i) Educational psychology is the application of psychological concepts to educative process.
- (ii) It is combination of two disciplines – education and psychology to assist each other.
- (iii) It is the result of interdisciplinary approach between education and psychology.
- (iv) It helps in making teaching – learning process more effective.
- (v) It provides the methods or techniques which can be used at different stages, growth and development.
- (vi) It helps in relating teaching activities to learning situations.
- (vii) It helps in bringing out desirable change in behaviour of students.
- (viii) It enables the teachers to understand the needs and the characteristics of the students of different stages.
- (ix) It makes the teaching – learning more purposive.
- (x) It helps in understanding, predicting and directing by education to achieve the goals of life.

Thus, it can be concluded that Educational Psychology is a relatively broader concept. It refers the existing as well as future scope of the application of psychology in educative process. Educational psychology is the systematic study of the development of the individual within the educational setting. It is the application of psychological findings in the field of education. There is no field or sphere of education which is not touched by psychology in a scientific way.

## **I.6 OBJECTIVES OF EDUCATIONAL PSYCHOLOGY**

Aims of Educational Psychology or objectives of Educational Psychology are parallel with aims of education. As it is evident from its meaning, educational psychology deals with teaching – learning process to help the all round development of the personality of the students. Various thinkers, educators and psychologists have given their views about objectives/aims of educational psychology.

**Kelly W.A.** a well known educational psychologist has reported that educational psychology aims at:-

- (i) Giving an insight to the teacher about the nature of the child.
- (ii) Enlightening the teacher with the growth and developmental process of the students.
- (iii) Helping the teacher in finding out ways and means of social adjustment for the child.
- (iv) Imparting knowledge about the principles and methods of learning.
- (v) Studying about the control of emotions and their educational importance.
- (vi) Giving knowledge about the character formation of the child.
- (vii) A study of techniques of evaluation of various school subjects.
- (viii) A study of the techniques/methods of psychology to investigate in different fields of education.

**Skinner** suggested the following ‘general’ and ‘particular’ aims of educational psychology.

### **General Aims :**

These are concerned with providing a body of organized facts and generalizations that will enable the teacher to realize increasingly both cultural and professional activities.

### **Particular Aims:**

- (i) Creating confidence in the teacher to plan harmonious development of the child.

- (ii) Approaching the problems of the children in a sympathetic and impartial manner.
- (iii) Planning education of children according to the age, ability and aptitude.
- (iv) Understanding the social problems of children and planning for the social adjustment.
- (v) Imparting knowledge to the teacher about the latest developments in the field of child-psychology and various methods of teaching.
- (vi) Enabling the teacher to evaluate himself and his methods of teaching.
- (vii) Helping the teacher to understand and analyse the behaviour of the child.
- (viii) Helping the teacher in solving the problem that may arise in the classroom.

As we have already understood that educational psychology is the science of teaching and learning, accordingly, the aims and objectives of educational psychology can be summed up as under:-

**(i) To understand the learner i.e. the child.**

Unless the teacher has some knowledge of the personality of the child, he can not go ahead with his task. Educational psychology helps the teacher to understand the child properly.

**(ii) To understand the learning process.**

It studies the laws of learning. Learning is a major phenomenon in education. It studies, how learning can take place, most effectively and economically.

**(iii) To study Human Behaviour.**

It studies human behaviour in education situation. Psychology is the study of behaviour and education deals with the modification of behaviour. Hence educational psychology covers the whole field of education.

**(iv) To study Growth and Development.**

It studies growth and development of the child. How a child passes through the various stages of growth and what are the characteristics of each stage are included into the study of educational psychology.

**(v) To study Heredity and Environment.**

It studies effect of heredity and environments, to what extent heredity and environment contribute towards the growth of the individual and how this knowledge can be made use of for bringing about the optimum development of the child.

**(vi) To study Individual Differences.**

Every individual differs from every other individual of the fundamental facts of human nature, which has been brought to light by educational psychology.

**(vii) To provide Guidance and Counselling.**

This is one of the most important aim of psychology. Education is nothing, but providing guidance to the growing child. The guidance forms an important aspect of educational psychology.

**G. Lester Anderson** has divided the aims of educational psychology into two categories:

1. General Aim
2. Specific Aim.

The general aim is one – to provide a body of organized facts and generalizations that will enable the teacher to realize both cultural and professional objectives.

**Specific Aims are several :**

- (i) To develop faith or conviction or belief that growth can be promoted, learning acquired and adjustment effected.
- (ii) To develop impartial attitude towards pupils.
- (iii) To give the teacher an improved and better perspective for judging both the results of his own teaching and educational practices of others.
- (iv) To enable the teacher to analyse the problems of students.
- (v) To set up better teaching procedures.

Thus, it can be concluded that objectives of educational psychology are directed to the development of wholesome personality and continuous educational growth and development.

### **CHECK YOUR PROGRESS 1**

**Notes:** (a) Write your answers in the space given below.

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

#### **(A) Tick the right choice.**

- (a) The process of education help in (getting degree/ defeating enemies/manifestations of in-born talents/ climbing mountains.
- (b) Educational Psychology is applied in (business/ improving handwriting/learning cycling/educational situations.
- (c) It was (Descartes/Freud/Shakespeare/Wilhelm Wondt) who established his psychological laboratory in Leipzig Germany in 1879.
- (d) Major focus of educational psychology is on (Physical development / agricultural training / all round development of the child.
- (e) 'Educational psychology is a systematic study of educational growth' is said by (Crow & Crow/Skinner/ Stephen/S.S.Chauhan.

#### **(B) Answer the following questions:-**

- (i) Define education in three sentences of your own

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- (ii) Which is the most comprehensive definition of Education psychology in your opinion.

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## **1.7 LET US SUM UP**

Students, in the first unit we have tried to give you an eye view of the most interesting subject educational psychology. After going through this unit you should be able to understand the concept of educational psychology. Aims and objectives of educational psychology are also discussed in detail. It has become clear that educational psychology is a practical science which takes the aid of psychology in solving educational problems. As a discipline, it is a collection of facts and principles of behaviour. In general, educational psychology means, the work in the sphere of psychology in every educational situation.

## **1.8 MODEL EXAMINATION QUESTIONS**

1. Briefly explain the term education.
2. “Psychology is the Science of behaviour”. Comment on the statement.
3. Explain the meaning of educational psychology by highlighting the opinions of different experts.
4. Explain the objectives of educational psychology in detail.

## **1.9 SUGGESTED READINGS**

Damral, B.D. and Dash, B.M. (2003). Psychological Foundations of Education, Kalyani Publishers, New Delhi.

Kakkar, S.B. (1995). Educational Psychology, Published by Prentice-Hall of India Pvt. Ltd., New Delhi.

Mangal, S.K. (1997). Educational Psychology, Prentice Hall of India Pvt. Ltd., New Delhi.

Mathur, S.S. (1994). Educational Psychology, Vinok Pustak Mandir, Agra.

Sharma, R.N. (2001). Foundations of Educational Psychology, Surya Publications, Meerut.

## **1.10 ANSWERS TO CHECK YOUR PROGRESS**

- A. (a) Manifestation of inborn talents.
- (b) Educational situations.
- (c) Wilhelm Wondt.
- (d) All-round development of the child.
- (e) Stephen
- B. (i) Refer to 1.3.
- (ii) Refer to 1.5.

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**METHODS OF STUDYING HUMAN BEHAVIOUR**

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**Structure**

- 2.1 Objectives
- 2.2 Introduction
- 2.3 Introspection Method of Studying Behaviour
  - 2.3.1 Definitions of Introspection Method
- 2.4 Process of Introspection Method
- 2.5 Merits of Introspection Method
- 2.6 Demerits of Introspection Method
- 2.7 Let Us Sum Up
- 2.8 Model Examination Questions
- 2.9 Suggested Readings
- 2.10 Answers to Check Your Progress.

**2.1 OBJECTIVES**

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

- (i) have an idea about various methods of studying human behaviour.
- (ii) Explain meaning of introspection method of educational psychology.
- (iii) Describe process of introspection method of studying behaviour.

- (iv) Explain advantages of introspection method.
- (v) Explain limitations of introspection method.

## **2.2 INTRODUCTION**

Psychology, as we have already discussed in the first lesson, is a science of behaviour and experience. Being a science it has special tools, procedures or methods which help in the collection and organisation of facts or data. Educational psychology uses all the methods of psychology to collect data on problems of behaviour of the teachers. Since educational psychology is an applied branch of general psychology it uses the research findings and principles developed by psychology in laboratory to improve classroom instruction. Human behaviour is dynamic and it can not be repeated exactly as before. Therefore, in the study of behaviour of children, adolescents and grown up people different methods are used.

## **2.3 INTROSPECTION METHOD OF STUDYING HUMAN BEHAVIOUR**

Method implies the system, by which we gain the knowledge. According to Oxford dictionary, 'Method' is a way of doing something, system of procedure, orderliness, conscious regularity etc. Charles Gide, "In scientific language, the term 'Method' is used to designate the road that must be followed to lead the discovery of truth". Method is a wider term than technique. In a method we have many techniques. Every scientific method is characterized by certain qualities. They are (1) Reliability (2) Reality (3) Purity (4) Objectivity (5) Verifiability (6) Impartiality (7) Precision and (8) Acceptability. Which method should be used depends upon the nature of problem under consideration.

Introspection is the oldest method of studying human behaviour. The method of introspection was developed by W. Wunt. He was structuralist. They defined psychology is the study of conscious experiences of an individual. It includes mental process of thinking, feelings and motives. An individual analyses his own mental process with self observation or looking within self and reports his own thinking, feelings and motives. In the state of anger an individual introspect his own mental feelings and report is known as introspection.

The term introspection is derived from two words "intro" and "spection". 'Intro' means "within" and "spection" means "looking" or "observing". Thus introspection means 'looking

within' or 'observing within' one self to experience one's own mental state. It is a kind of self observation or self examination. Woodsworth calls introspection as "self observation" and Angell defined it as "looking inward". It is also called as subjective observation.

### **2.3.1 DEFINITIONS OF INTROSPECTION METHOD**

1. **William James**, "Introspective observation is what we have to rely on first and foremost and always."
2. **Stout**, "Introspection is to attend to the working of one's own mind in a systematic way."
3. **C.V. Good**, interpreted introspection as the act of studying ones own thoughts, motives and feelings and self-analysis. Further, experimental interpretation is made of investigation by which subjects are exposed under controlled conditions to selected situations or stimuli, such as combinations of colour, musical sounds, sentences or words and each observes and report the mental states of reactions evolved in himself.
4. **Locke**, the founder of British psychology interprets introspection as looking into the working of one's own mind and reporting what is found there. It involves attending to one's own experience, turning inwards in self-contemplation and observing the states and processes of one's own mind.

After going through the above definitions it can be concluded that :-

- (i) the subject get direct, immediate and intuitive knowledge about the mind.
- (ii) The subject has actually to observe his own mental processes. He can not speculate about them.

### **2.4 PROCESS OF INTROSPECTION METHOD**

Let us explain the process of introspection with the help of an example. For instance, if a person experience ecstasy, he may express himself by saying, "I am the happiest man in the world." On the other hand, if he is miserable, he expresses his sorrow in similarly appropriate terms. Introspection takes place when two processes become active:-

- (a) the individual himself observes or examines his own mental, states, action and

reactions;

- (b) after the observation, the individual himself gives expression to his awareness of this action and reaction.

In the process of introspection there are following three stages:-

**(A) Observation Stage**

During the observation of an external object, the person begins to ponder over his own mental states. For example, while listening to the music, which is to him pleasant or unpleasant, he starts thinking about his own mental state.

**(B) Questioning Stage**

The person begins to question the working of his own mind. He thinks and analyses. Why has he said such a thing? Why has he talked in a particular manner? And so on.

**(C) Reasoning Stage**

He tries to frame the laws and conditions of mental processes. He thinks in terms of the improvement of his reasoning or the control of his emotional stages. This stage is that of scientific methods for the advancement of our systematic knowledge.

## **2.5 MERITS OF INTROSPECTION METHOD**

### **1. No need of tools**

The most outstanding advantage of this method is that it does not necessitate the use of special instruments or tools. It is a method in which the study is conducted most conveniently.

### **2. Helpful in comparative studies**

This method proves very useful in the comparative study of any problem. By comparing the results provided by two different methods, it becomes easy to arrive at a specific conclusion and among these methods, introspection has a specific significance.

**3. Time and Place – no bar**

It can be done at any time and at any place because individual's mind is his own laboratory.

**4. Improvement in Personality**

It is useful in bringing improvement in one's personality e.g. if there is any sort of abnormality, the individual can suggest some remedy to remove it by introspection.

**5. Time – honoured Method**

It is a time honoured method which is available only in psychology and not in other natural sciences.

**6. Mind under intoxicants**

It is the best method for knowing the mind under intoxicants, feelings, emotions, sentiments, prejudices and pains. It is said, "It is only the wearer knows where the shoe pinches."

**7. Part of experimental report**

It forms an important part of experimental report. While writing experimental report we include introspective report of the subject.

**8. Improvement in teaching**

Self-evaluation and self suggestions help the teachers for improvement of their teaching.

**9. Simplest and economic method**

This method is simplest and most economical method as it requires no laboratory or finance.

**2.6 DEMERITS OF INTROSPECTION METHOD**

The introspection method, despite its convenience and simplicity, presents a number of demerits or disadvantages enumerated as under :-

1. **Individual and subjective**

This method is both, highly individual and subjective, and it is not at all necessary that the subject will provide an accurate account of his feelings or reaction. The reason is that the individual himself is the examiner as well as the subject or examinee, and it is not easy for an individual to make an impartial, objective and scientific assessment of his own mental states.

2. **Inconsistency in results**

In the introspection method, there are often no consistency between the results obtained by two observers. As J.S. Ross has rightly pointed out, "Introspection suffers from the defect of subjectivity, i.e., its results depends on the observer and is not verifiable by the other observer."

3. **Dynamic behaviour**

Human behaviour is dynamic, it changes from one second to next consequently, so it becomes difficult to study his dynamic behaviour through introspection.

4. **Division of Mind**

In the introspection method, the individual's mind is split into two. One part of it performs the function of the observer by which he observes the emotion or mental state. The other part of it functions as the subject which actually experienced the mental state. J.S. Ross has clarified this obstacle in the following words – "In introspection it is unfortunately true that more material there is, the less is the power to observe it."

5. **Incapable on children and animals**

One important limitation of the introspection method is that it can not be used at all in case on animals and children. Children are naturally so spontaneous and active that they cannot provide an accurate description of any sensation, emotion or mental state. Animals, of course, can not communicate their observation to us in a language which we can understand.

6. **Lacks reliability, validity and objectivity**

The results lack reliable communicability and repeatability because one investigator can never be sure that what he feels or senses is the same as is experienced by other investigators. Moreover, in introspection one studies one's own behaviour or mental process and it is not possible to verify self-observation. It is impossible to acquire validity and exactness in self-observation.

Thus, if we try to evaluate the introspection method, we find that it is based on self-speculation, lacks reliability, replicability and reasonable exactness or precision. It is neither sufficiently scientific, practicable nor simple enough to handle. It cannot therefore be taken as an adequate or sufficient single method of psychological studies.

**CHECK YOUR PROGRESS 2**

Note:-(a) Write your answers in the space given below:

(b) Compare your answers with those given at the end of the lesson.

(A) Fill in the blanks by making right from the alternatives in the brackets.

(i) According to \_\_\_\_\_ a method is a way of doing something. (Plato/Oxford dictionary)

(ii) Introspection is the oldest method of studying \_\_\_\_\_ (human behaviour/objectively).

(iii) "Introspective observation is what we have to rely on first and foremost and always" is propounded by (Stout/William James). \_\_\_\_\_

(iv) Introspection is 'looking inward' is defined by \_\_\_\_\_ (Woodsworth/Angell).

(v) Introspection is individual and subjective is \_\_\_\_\_ (Merit/Demerit).

(B) Answer the following questions in three lines:

(a) What do you mean by introspection?

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(b) Explain the process of introspection briefly?

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## **2.7 LET US SUM UP**

Dear students in this lesson we have tried to acquaint you with introspection method of education psychology. The understanding of behaviour depends upon two types of observation: observation from within by the subject himself or self observation and observation from without by others i.e. objective observation. Self observation is called as introspection. We have discussed process of introspection. Merits and demerits of this method of studying human behaviour are also discussed in detail. Because of the limitations in the introspective method, the modern psychologists pay relative little attention to this method of studying human behaviour. Educational psychologists use objective observation and experimental methods more frequently to enrich their field of study.

## **2.8 MODEL EXAMINATION QUESTIONS**

1. Discuss the meaning of introspection method of studying human behaviour.
2. Explain steps involved in the process of introspection.
3. Explain advantages/merits of introspection method.
4. Explain limitations/demerits of introspection method.
5. What is introspection? Discuss its merits and demerits as a method of psychology.

## **2.9 SUGGESTED READINGS**

1. Aggarwal, J.S. (1995). Essentials of Educational Psychology, Vikas Publishing House Pvt. Ltd., New Delhi.

2. Chauhan, S.S. (1987). Advanced Educational Psychology, 6<sup>th</sup> ed. Vikas Publishing House Pvt. Ltd., New Delhi.
3. Kuppaswamy, B. Advanced Educational Psychology, Sterling Publishers.
4. Kulshreshtha, S.P. (2001). Educational Psychology, Surya Publications, Meerut.
5. Mangal, S.K. (1997). Educational Psychology, Prentice Hall of India Pvt. Ltd., New Delhi.
6. Saxena, A. and Bhatnagar, S. (2001). Advanced Educational Psychology, Surya Publications Meerut.

### **2.10 ANSWERS TO CHECK YOUR PROGRESS**

- A.
- (i) Oxford dictionary
  - (ii) Human behaviour
  - (iii) William James
  - (iv) Angell
  - (v) Demerit.
- B.
- (a) Refer to 2.3 and 2.3.1
  - (b) Refer to 2.4

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**OBSERVATION METHOD OF STUDYING HUMAN BEHAVIOUR.**

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**Structure**

- 3.1 Objectives
- 3.2 Introduction
- 3.3 Meaning of Observation Method
  - 3.3.1 Definitions of Observation Method
- 3.4 Types of Observation
- 3.5 Steps in the Process of Observation
- 3.6 Merits of Observation Method
- 3.7 Demerits of Observation Method
- 3.8 Let Us Sum Up
- 3.9 Model Examination Questions
- 3.10 Answers to Check Your Progress.

**3.1 OBJECTIVES**

After going through this lesson you shall be able to understand:-

- (i) meaning of observation method of studying human behaviour.
- (ii) Steps in the process of observation.
- (iii) Meaning of controlled and uncontrolled observation.

- (iv) Merits of observation method.
- (v) Demerits of observation method.

### **3.2 INTRODUCTION**

Educational psychology is the scientific study of the behaviour of the learner in relation to his educational environment. Behaviour in all its aspects can be studied scientifically through a single technique or approach known as observation. This leads us to simple conclusion that observation may be regarded as the only method or technique for conducting studies of behaviour. This single technique or approach, however, gives rise to several methods or approaches, depending upon the condition in which observations have to be recorded, the procedure adopted and tools used. How is the student of education to get the knowledge of human behaviour? This brings us to the methods of psychological study. As in all sciences, in psychology too, observation is the chief method of study.

### **3.3 MEANING OF OBSERVATION METHOD**

With the application of scientific principles to psychology, sheer speculation of human behaviour was given up altogether. The psychologists tried to follow scientific and objective methods like observation for its study. Strictly speaking, there is only one method which is always pursued by sciences. Observation is not an easy task and does not merely involve looking on. The observer has to be trained to faithfully report what he observes and to guard against the tendency to see what he wants to see. A psychologist has a special opportunity to observe. He can study from within and from outside. While studying the behaviour of an individual, we naturally observe his overt acts, especially acts that involve the activity of the limbs, changes in the sense organs, the expression on the face and the like. At the same time, we ask him to observe his inner life of thoughts and feelings, fear and anxiety.

The word observation has been derived from the Latin word “Observare” which means “to keep open”. On the face of it, observation seems to be easy and simple. We simply keep our eyes open and we see certain things. But it is not quite so simple as it seems. It involves a mental process. In all observations these are two elements, the sense perceptual and the mental. We make observations with the help of senses like seeing, hearing etc. but along with mind also work. Observation, also involves interpretation of the

sense experiences by our minds.

Observation method is also known as introspection. In this method, the observer, observes the behaviour of another person, who is the subject. In doing this, the observer takes advantage of his past experience and arrives at inferences regarding the mental states of the subject. It is an ability to see analytically, in details, directed participation which is almost entirely an acquired skill, its use arise from the individual's desire to reuse his senses impressions to clarify his conceptual knowledge and build up the his memory. In this method of observation/introspection, three activities has dominant role:-

1. Observation of the behaviour of another person.
2. Experience of the behaviour of other person.
3. Analysis of behaviour on the basis of past experience.

In this context Stout has provided a simple but illuminating example. He says when a dog wags his tail, we conclude that creature is happy. If we observe a child crying, our awareness of this fact constitutes the introspection. We, then infer that probably the child has not been fed. Behaviour in the classroom is also analysed in this way children who fail to understand their teacher allow various kinds of expressions to appear on their faces. In contrast, children who have understood begin waving their hands vigorously if they are asked question regarding what has just been taught. This activity leads the teacher to infer that they have understood whatever has been taught.

### **3.3.1 DEFINITIONS OF OBSERVATION**

#### **1. P.V. Young**

“Observation means to employ listening and seeing about the situation of an individual.”

#### **2. C.A. Moyger**

“The solid meaning of observation is to use vision or eyes rather them listening or hearing.”

### **3. Samuel Smith**

“Observation is a visual and aural method of examining, describing and interpreting the reactions of individuals and groups in laboratory, classroom, or out of school situation.”

Thus on the basis of above, we can point out following characteristics of observation :-

#### **1. Observation is objective**

In observation method maximum flexibility and open mindedness is maintained. Therefore, it is free from bias and prejudice.

#### **2. Observation is quantitative**

In observation method, information is gathered in a quantitative form. Even the qualitative data is also converted into a quantitative format because quantitative data becomes more objective in itself and can be interpreted in a more realistic form.

#### **3. Expertise in observation**

In observation, the observer is an expert who knows clearly and precisely about his work. As an expert, he plans and structures his observation in order to avoid the pitfalls.

#### **4. Immediate recording of observation**

In this method, observations are recorded immediately in a written form in order to avoid the undesired forgetting of the facts.

#### **5. Observation is systematic and specific**

Observation is not carried in a haphazard and casual way but it is carefully planned and skillfully executed.

#### **6. Verifiability of observation**

Observation fulfills the criteria of validity, reliability and usability.

### **3.4 TYPES OF OBSERVATION**

Observation is of two types:-

- (i) Controlled observation
- (ii) Uncontrolled observation.

Observation under controlled conditions is known as controlled observation. It is also called as experimental observation.

Uncontrolled or naturalistic observation means observing the behaviour of others in a natural or uncontrolled conditions. It consists of simply observing bodily actions, bodily changes, gestures, facial expressions, sounds and movements of persons or animals.

### **3.5 STEPS IN THE PROCESS OF OBSERVATION**

Following steps are involved in the process of observation: -

#### **1. Planning :**

Planning is the process of thinking before doing. Observation should be planned rather than haphazard. The activities should be well defined and full attention is focused on them. These should be planning regarding the length of the observation, time interval regarding the two observations and the number of observations. The recording instruments are to be kept ready in hand. Behaviour is to be observed carefully and accurately with a specific purpose in mind.

#### **2. Instructions**

Detailed instructions are given to the observers so that a consistency is maintained and differences of opinion are eliminated.

#### **3. Suitable questionnaire**

Suitable readymade questionnaire should be prepared so that time and energy may not be wasted on irrelevant things.

**4. Suitable instruments**

Observer should equip himself with suitable instruments like a moving camera, tape recorder etc. to observe minute details. One way screen should be used so that the person whose behaviour is going to be observed may not become conscious and show artificiality in his behaviour.

**5. Recording**

Immediately after observation, the observed facts are recorded carefully. Method of recording should be as simple as possible. Moreover, it should also be objective.

**6. Variables**

Too many variables of behaviour are not observed simultaneously in a single observation instead only the specific and defined variables are taken into consideration.

**7. Temporal Arrangement**

Temporal arrangement means the management of time. Therefore, length of each observation period, intervals between periods of observation and number of periods of observation are stated in clear and definite terms.

**8. Analysis**

In the process of observation, observed facts are analysed minutely and thoroughly.

**9. Interpretation**

In this step the results obtained by observation are interpreted in a logical manner. The observer has to state the following:

- (i) What do the results (finding of observation) show ?
- (ii) What is the meaning of these findings?
- (iii) What is the significance of findings?
- (iv) What is the standpoint of the observer regarding the behaviour under investigation.

## 10. Verification and Generalization

In the last stage, the results of observation are verified by comparing the results of different observers or by repeating the procedure of observation many times. Afterwards these results are generalized.

### 3.6 MERITS OF OBSERVATION METHOD

Following are the merits of observation method :-

#### (i) **Objective and Scientific**

Observation is more objective and scientific than introspection method. Observation is free from bias and prejudice.

#### (ii) **Planned and Systematic**

Observation is a well planned and systematic activity. Activities are well defined and planned and then only behaviour is observed in a systematic way.

#### (iii) **Reliable and specific**

The findings by observation method are more reliable and more valid. It is also specific because at the very outset of observation, the points of observation are specified and written carefully with a specific purpose in mind.]

#### (iv) **Economical and Flexible**

It is economical as it does not involve the use of costly apparatus and costly materials. It does not involve heavy expenditure. It is flexible and can be used in gathering data in many situations. Observer can easily adjust himself according to the confronted situations.

#### (v) **Ground for Experimental Method**

It prepares ground for experimental method, as experiment is nothing but objective observation under rigidly controlled or laboratory conditions.

#### (vi) **Study of behaviour of children, abnormal persons and animals**

It can be applied to observe the behaviour of children, abnormal persons and animals.

**(vii) Study of exceptional cases**

Observation method is also appropriate tool in cases of deaf and dumb children, in serious cases of abnormality or mad persons, for non-cooperative persons and for persons who do not understand our language.

**(viii) Useful in educational situations**

With the help of this method supervision of classroom teaching can be made; behaviour of problem children, backward children, gifted children, delinquent children can be studied; and outcome of education can be known.

**(ix) Study of Physical aspects of School**

It also helps to study physical aspects of school buildings, or students and teachers etc. The characteristics of a school building can be studied by observing and recording such aspects as materials of construction, number of rooms for various purposes, size of rooms, amount of furniture and equipment and presence or absence of certain facilities.

**(x) Sports and Games**

The behaviour of the players in action in games and sports is observed by the coach and the selectors. These observations form the basis to improve the performance of the players as well as the team.

**3.7 DEMERITS OF OBSERVATION METHOD**

Although observation is considered as an effective method for psychological and related studies, yet is not free from criticism. It suffers from the following drawbacks or demerits:-

**(i) Problem of trained observers**

It is very difficult to get trained observers. Untrained observers may gather superfluous and irrelevant data and may hamper the validity and reliability of observation.

**(ii) Element of Subjectivity**

It is subjective. Observer may become lenient i.e. he may give concessions and allowances at one time and may be strict at another time. Some studies have shown that strong

personal interests tend to make the observer see only those things which he wants to see.

(iii) Artificiality of behaviour

Sometimes artificiality comes in the behaviour e.g. crocodile tears or behaviour of Hippocrates. Moreover artificiality comes in the behaviour of children and women when they see the stranger.

(iv) Slow and time consuming

Observation method is slow and time consuming process. A particular situation to be observed may take a long time to occur under natural conditions.

(v) Internal Behaviour

Observation is quite successful in the observation of external behaviour but it is difficult to use observation method in the study of internal behaviour.

(vi) Projection of behaviour

An observer tends to see only those things which he wants to see. Perceptions are subject to distortions because of observer's personal interests, emotions, motivations, prejudices and mental sets. Thus the observer may make a projection of his own behaviour while observing the others.

**(vii) Lack of validity**

It is always difficult to establish the validity of observation. We can not define all the items of observation with sufficient precision. In an attempt to define or isolate the items of observation, we may give false definitions thus resulting in lack of validity.

**(viii) Expensive**

Observation method sometimes proves to be very expensive. It may involve expenses on traveling, staying at the place where phenomenon is to be observed and purchasing of sophisticated equipment.

Though method of observation has many limitations yet it is considerably used in child psychology and educational psychology. So we can say that this method has helped the application of psychology to education and wherever possible it should be supplemented by the use of experimental procedure.

### **CHECK YOUR PROGRESS – 3**

**Notes:- (a) Write your answers in the space given below.**

- (b) Compare your answers with those given at the end of the lesson.
- (A) Fill in the blanks with appropriate words:-
  - (i) The word observation has been derived from the Latin word \_\_\_\_\_ which means to \_\_\_\_\_.
  - (ii) Observation method is also known as \_\_\_\_\_.
  - (iii) “The solid meaning of observation is to use vision or eyes rather than listening or hearing”. This definition is given by \_\_\_\_\_.
  - (iv) Observation carried under \_\_\_\_\_ conditions is known as controlled observation.
  - (v) Management of time is called as \_\_\_\_\_.
- (B) (i) What do you mean by observation?

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- (ii) Give any three merits of observation method.

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### **3.8 LET US SUM UP**

In this lesson every effort has been made to give you an eye view of the observation method. Concept of observation method is discussed in detail. Steps in the process of observation method are also discussed. You will also be familiarized with merits and demerits of observation method. It is evident that so as to make this method result oriented, only experienced and trained observers should be employed. Modern devices such as tape recorders, cameras, one way screen, video cameras and the like should be made use of. At one time, some one particular quality and trait should be placed under observation so as to minimize the possibility of error. All the steps in the observation process should be followed carefully and separately.

### **3.9 MODEL EXAMINATION QUESTIONS**

1. What do you mean by observation?
2. What is controlled and uncontrolled observation?
3. Explain the process of observation method.
4. What are the merits and demerits of observation method?

### **3.10 ANSWERS TO CHECK YOUR PROGRESS**

- A. (i) Observare, keep open  
(ii) Extropection  
(iii) C.A. Moyger  
(iv) Controlled

- (v) Temporal Management.
- B. (i) Refer to 3.3 and 3.3.1
- (ii) Refer to 3.6.

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**EXPERIMENT METHOD OF STUDYING HUMAN BEHAVIOUR.**

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**Structure**

- 4.1 Objectives
- 4.2 Introduction
- 4.3 Meaning of Experimentation Method
  - 4.3.1 Definitions of Experiment Method
- 4.4 Steps in the Process of Experimentation
- 4.5 Merits of Experimentation Method
- 4.6 Demerits of Experimentation Method
- 4.7 Let Us Sum Up
- 4.8 Model Examination Questions
- 4.9 Suggested Readings
- 4.10 Answers to Check Your Progress.

**4.1 OBJECTIVES**

After going through this lesson you shall be able to :-

- (i) Explain the meaning of experimentation method.
- (ii) Describe the process of experimentation method.
- (iii) Explain merits of experimentation method.
- (iv) Describe demerits of experimentation method.

## 4.2 INTRODUCTION

The experimental method is considered the most scientific and objective method of studying behaviour. It lays emphasis on performing experiments and is basic scientific method. It holds central position in the psychology as well as in other sciences. It is experimentation which has the credit of bringing educational psychology to the level of exact sciences. **Collins** and **Drever** have beautifully remarked “Psychology without an experimental part is an anachronism.” Modern educational psychology places the greatest emphasis on experimentation. Experiment is observation made under carefully controlled conditions. The teacher is faced with many classroom problems which he can solve with the help of experiments. In order to identify the cause of factor which leads to mental fatigue, the subjects are asked to solve some statistical problems under controlled factors or conditions that can possibly cause mental fatigue, so that the fatigue caused may be attributed to a specific factor.

## 4.3 MEANING OF EXPERIMENTATION METHOD

The experimental method was first of all introduced by William Wundt in 1879 at Leipzig Laboratory. In 1880, Ebbinghaus conducted many experiments on memory. Thorndike, Judd and Freeman conducted many experiments in various fields.

The word ‘experiment’ comes from a Latin word ‘experimentum’ meaning ‘a trial’ or ‘test’. Therefore, in experimentation we try or put to the test the material or phenomenon whose characteristics we wish to ascertain. In educational psychology we perform experiments in the psychological laboratory, classrooms or outside the classrooms in physical or social settings to study the cause and effect relationship regarding the nature of human behaviour i.e. the effect of intelligence, or participation in co-curricular activities, the effect of anxiety, drugs or stresses on human behaviour etc. In performing all such experiments we try to establish certain cause and effect relationships through objective observations of the actions performed and the subsequent changes produced under pre-arranged or rigidly controlled conditions. Every experiment should have (1) Psychological laboratory (2) Experimenter, who will carry the experiment (3) Subjects, on whom the experiment will be performed (4) Stimulus, which impinges the person to behave or to react, (5) Response includes the reaction and changes in behaviour of subject to stimulus, (6) Variable consist of factors with which the experimenter is concerned. Variable refers to any event or process

that may assume different values. These may be independent or dependent variable. The variable which is systematically and independently varied or manipulated by the experimenter is known as 'independent variable' while the dependent variable is the factor which the experimental predicts will change as a result of changing the independent variable.

#### **4.3.1 DEFINITIONS OF EXPERIMENT METHOD**

Important definitions of experiment method given by the eminent psychologists are :

**1. Jahoda et. al;**

“An experiment is a method of testing hypotheses.”

**2. F.S. Chapin**

“An experiment is an observation under controlled conditions.”

**3. H.J. Eysenck**

“An experiment is the planned manipulation of variables, the independent or experimental variable is affected under predetermined conditions during the experiment.”

**4. Festinger and Katz**

“The essence of an experiment may be defined as observing the effect on a dependent variable of the manipulation of an independent variable.”

**5. Wilson**

“An experiment is a question formed on the basis of what is known and addressed to the nature to elicit knowledge. It is consciously directed and purposeful observation.”

On the basis of above definitions, it is quite clear that the experiment method requires a controlled situation in which the experimenter manipulates independent or experimental variable in a planned manner and observes its effect on dependent variable.

#### **4.4 PROCESS OF EXPERIMENTATION**

Following are the various steps in planning and conducting of psychological experiments :

**1. Label the experiments**

The title of the experiment should be clearly specified.

**2. Reviewing past literature**

All of the previous work that is relevant to the experiment should be studied. Review of past literature helps in locating a problem for experimentation and in formulating a hypothesis in a clear and specific way.

**3. Statement of the problem**

After reviewing of past literature, experiences and daily observations the experimenter raises the problem in a suitable words. It should be concise, well structured and unambiguous.

**4. Formation of Hypothesis**

When a problem is clearly defined, the experimenter tries to formulate some good hypothesis. Hypothesis is a suggested answer to a problem or a proposition to be put to test, to determine its validity. It is written in three ways:-

- (i) Declarative Form states a relationship between the variables that the experimenter expects will emerge.
- (ii) Null Form states that there is no relationship exists between the variables concerned.
- (iii) Question Form states the hypothesis in question form.

**5. Designing and manipulating the independent or stimulus variable.**

The experimenter after designing the independent variable should decide how exactly he is going to vary it. Suppose a hypothesis is that noise interferes with mental alertness. Here we should decide how to produce the noise, what type of

noise it is, its intensity and duration etc. Musical noise may have a different effect from a buzzing noise.

## **6. Dependent variable and its measurement**

Another important step in planning the experiment is that responses to be studied should be operationally defined. For example, if you want to study mental activity, there are various possible behaviours which indicate this, sitting posture, quickness of hearing, ability to distinguish between sound etc. The experimenter will have to choose that particular behaviour to observe, which is truly indicative of mental alertness or whatever may be the psychological function studied.

## **7. Establishing Controls**

The next step in the process of experimentation is to find out intervening variables and other environmental factors that may influence our results. Steps must be taken to maintain uniformity and homogeneity among the subjects by eliminating, counter balancing environmental conditions arranging proper schedule etc.

## **8. Selection of Experiment's design**

The experimenter may choose any design according to his need and purpose of the experiment. There are various experimental designs:-

- (i) Two-groups-design i.e. where the results of an experimental group are compared to those for a control group.
- (ii) Multi-group design in which several groups are used instead of any two.
- (iii) Factorial design in many cases is the most efficient and is being used more and more in psychology.

## **9. Selection of Subjects**

Selection of subjects is another important step in the process of experimentation. To a large extent the nature of subjects i.e. children, men, women, students, workers etc. is determined by the hypothesis. As far as possible the subjects should be matched and made uniform on all variables other than proposed independent variable. It should be made clear how the subjects are to be selected:-

(i) by random assignment (ii) on the basis of some criterion (iii) on the basis of membership in an already established group (iv) on the basis of availability. The method of selection should be clearly stated.

**10. Experimental procedure**

The procedure for conducting the collected phase of the experiment should be set down in great detail. The experimenter should carefully plan how the subjects will be treated, how the stimuli will be administered, how the response will be observed and recorded.

**11. Analysis of the results**

The next step after conducting experiment is the analysis of the data. It is to be planned earlier whether qualitative or quantitative analysis to be made

**12. Inference and Conclusion**

Results should be interpreted. While formulating conclusions, conditions should be kept in mind under which the experiment was conducted, the extent of control obtained and the type of subjects selected.

**13. Confirmation and verification**

The results and its analysis should either confirm or reject the previously formulated hypothesis or hypotheses. The experiment can also be repeated to verify the results of the experiment.

**14. Reporting the results**

Finally, the results of the study should be reported to others in detail so that the readers can make their opinion and judgement regarding the adequacy of the experimental investigation.

**4.5 MERITS OF EXPERIMENT METHOD**

Experimental method is the most scientific method among all the methods of educational research. This method is considered as highly developed, formalized and most

accurate method of studying behaviour. This method has following merits:-

**1. Reliable and Scientific**

It is most reliable, most valid and most systematic, most precise, most exact, most objective and hence most scientific method. It is a method which has made psychology a science and put it on scientific footing.

**2. Wide applications**

It has wide applications in all the branches of psychology especially in intelligence measurement, personality measurement, attitude formation, individual differences and mental disorders. Experimental investigation have thrown light on different methods and laws of learning and memory, attention, interest, motivation, growth and development and finally development of personality.

**3. Quantitative measurement**

It has introduced quantitative measurement in psychology. Individual is studied internally by this method in a quantitative manner like the study of emotion, motivation, learning and perception etc.

**4. Pre-planned**

It can be preplanned and the experimenter can be fully prepared for accurate observation.

**5. Utility in Education**

This method has been widely used in almost all the aspects of education i.e. in determining the aims of education, curriculum, methods of teaching, framing timetable, measuring the achievements of the pupils and in guidance programme.

**6. Diagnostic Value**

This method is of great help in the diagnosis of cases where learners suffer from personal, social and educational abnormalities.

**7. Verifiable**

The results of experimental method are verifiable by other investigators under similar conditions in which the original experiment has been conducted.

**8. Establishment of cause and effect relationship**

A psychological experiment establishes a cause and effect relationship between independent and dependent variables.

**9. Computerised data analysis**

In recent years, computers are being used for data analysis. Thus more and more complex problems can now be studied through the use of experimental method.

**4.6 DEMERITS OF EXPERIMENTAL METHOD**

The experimental method suffers from the following drawbacks: -

**1. Lengthy and time consuming**

It is very lengthy, time consuming and energy consuming.

**2. Expensive**

It is very expensive or costly as it requires well equipped laboratory or apparatus and experts to handle them.

**3. Difficulty in controlling variables**

All the variables cannot be completely controlled. Experiments on heredity cannot be conducted on human beings under controlled conditions.

**4. Problem of measuring dependent variable**

There is problem of measuring dependable variable. We do not have anything like a thermometer or an inch scale or weight box. We cannot say that such and such person has so much anxiety.

**5. Artificiality**

There is certain amount of artificiality of laboratory conditions and this artificiality does curb our results.

**6. A gulf between laboratory and life**

In the laboratory we control all other variables and arrive at a finding regarding the relation between specific stimulus and a specific response. In actual life, several stimuli act at the same time and several responses and life. Hence there is a gulf between laboratory experiments and life.

**7. Every Phenomenon cannot be studied**

Every phenomenon cannot be studied in the laboratory e.g. to study the causes of abnormality and abnormal behaviour we cannot make our subject mad. Similarly we cannot retard the growth of a child to find out the causes of retardation.

**8. Lack of Universal application**

Psychological experiments are conducted upon small samples. The results obtained from small groups cannot be applied to the whole population. Hence this method lacks the element of universal application.

**9. Contamination**

Contamination is a type of bias introduced when the experimenter has some previous knowledge about the subjects involved in an experiment.

**CHECK YOUR PROGRESS - 4**

Note:- (a) Write your answers in the space below.

(b) compare your answers with the one given at the end of the lesson.

**(A) Choose the correct answer out of four options given against each question.**

(i) “Psychology without an experimental part is an anachronism” is given by:-

- |                        |               |
|------------------------|---------------|
| (a) Plato              | (b) Aristotle |
| (c) Collins and Drever | (d) Gestalt.  |

(ii) The experimental method was first of all introduced by whom at Leipzig laboratory:-

- |                |                   |
|----------------|-------------------|
| (a) Ebbinghaus | (b) William Wundt |
|----------------|-------------------|

- (c) Thorndike                      (d) Freeman.
- (iii) What is called answer to a problem or a proposition to be put to test to determine its validity:
- (a) Statement                      (b) Aim
- (c) Hypotheses                      (d) Plan.
- (iv) Which one of the following is not a step in the process of experiment method:-
- (a) Formation of hypotheses
- (b) Reliable and specific
- (c) Estabbling controls
- (d) Selection of subjects.
- (B) (i) Name the various steps in the process of experiment method:

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#### 4.7 LET US SUM UP

Students in this lesson we have tried to give you an eye view of experiment method of educational psychology. It is the basic and scientific method for studying human behaviour. We have also explained various steps involved in the process of experiment method. Merits and demerits of this method are also discussed in detail. Though experimental method has some limitations yet it is very useful in almost all the branches of educational psychology. It can work as a miracle if it is supplemented by psychological observation or introspection. **Titchner** has remarked that “Experimental – Introspection” is the best psychological method.

#### 4.8 MODEL EXAMINATION QUESTIONS

1. What do you mean by experimentation method ?
2. Explain the process of experimentation method.
3. Give the merits of experimentation method.
4. Explain demerits of experimentation method.
5. “It is the experiment method which has made psychology a science”. Discuss.

#### **4.9 SUGGESTED READINGS**

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2. Chauhan, S.S. (1987). Advanced Educational Psychology, 6<sup>th</sup> Ed. Vikas Publishing House Pvt. Ltd., New Delhi.
3. Kundu, C.L. and Tutoo, D.N. (1988). Educational Psychology, Sterling Publishers Pvt. Ltd., New Delhi.
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5. Mathur, S.S. (1994). Educational Psychology, Vinok Pustak Mandir, Agra.
6. Damral, B.D. (2004). Foundations of educational psychology, Published by Radha Krishan Anand & Co. Jammu (J&K).
7. Walia, J.S. (1996). Foundations of Educational Psychology, Paul Publishers, Jalandhar (Punjab).

#### **4.10 ANSWERS TO CHECK YOUR PROGRESS**

- (A)
- (i) Collins Drever
  - (ii) William Wundt
  - (iii) Hypotheses
  - (iv) Reliable and specific
- (B)
- (i) Refer to 4.4.

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**STAGES OF HUMAN GROWTH AND DEVELOPMENT**

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**Structure**

- 5.1 Objectives
- 5.2 Introduction
- 5.3 Concept of Growth
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  - 5.8.5 Educational Provisions
- 5.9 Let Us Sum Up
- 5.10 Model Examination Questions
- 5.11 Suggested Readings
- 5.12 Answers to Check Your Progress.

## **5.1 OBJECTIVES**

After going through this unit, you shall be able to:-

- (i) explain the concept of growth and development.
- (ii) explain infancy stage of growth and development with reference to physical, intellectual, emotional and social development.
- (iii) describe educational provisions for infancy stage of development.
- (iv) explain childhood stage of growth and development with special reference to physical, intellectual, emotional and social development.
- (v) discuss educational provisions for childhood stage of development.
- (vi) explain adolescence stage of growth and development with reference to physical, intellectual, emotional and social development.
- (vii) discuss educational provisions for adolescent stage of development.

## **5.2 INTRODUCTION**

Change is the law of nature. Animals or inanimate objects are all subject to change. Animate objects are distinguished from inanimate objects chiefly by their potentiality to maintain the flow and cycle of life. As far as human being is concerned, life starts with the conception in the mother's womb as a result of the process of fertilization of the ovum (egg cell) of the mother by the sperm cell of the father. The period spent in the mother's womb is termed as pre-natal period and is usually not included in the computation of one's chronological age. The process by which a germinating seed or conceived organism is turned into a mature plant or full-fledged being are collectively termed growth and development. Human beings keep on changing in their physical, social, intellectual, emotional, psychological traits from conception to death. In the course of changes, new features appear and old disappear. What the pattern at any stage will be, depends upon the genetic factors (heredity) and upon the influences being brought to bear upon the individual from his surroundings (environmental).

In this unit we shall discuss the concept of growth and development. Stages in the process of growth and development viz. infancy, childhood, adolescent with reference to physical, intellectual, emotional and social development are also discussed in detail. You will be also made aware of the educational provisions for different stages of growth and development.

## **5.3 CONCEPT OF GROWTH**

The word 'Growth' refers to the orderly, progressive development of the total individual in harmony with the best ideals of our culture. Growth is a general term which includes maturation, learning and development. Maturation stands for a process and a stage or culmination, of a phase of growth. Physical and mental growth are the major aspects of an individual's growth as a whole. Physical growth means a change in structure of the organism, especially an increase in size. Mental growth refers to adaptive changes in function and behaviour accompanied by a consciousness of purpose or a striving for a goal. Growth manifests itself in changes occurring in various organs and parts, but is itself general for the organism. It is the whole person who grows, or is educated. It is the total personality i.e. the totality of the individual's action patterns and characteristics as evaluated socially, which grows.

### **5.3.1 Definitions of Growth**

The following definitions of growth will give you in-depth understanding of the concept of growth:

Crow and Crow defines, “growth as structural and psychological changes.”

Frank defines growth as, “the multiplication of cells i.e. growth in height and weight or it may be changes in the particular aspects of the body or it means increase and enlargement of the body or some part of the body.”

### **5.4 CONCEPT OF DEVELOPMENT**

Development may be defined as the progressive series of orderly coherent changes. The term ‘Progressive’ signifies that changes are directional, that they lead forward rather than backward. The term ‘orderly’ and ‘coherent’ suggest that there is a definite relationship between the changes taking place at present and the changes that will precede or follow them.

Development refers to change in structure form or shape and improvement in functioning e.g. hands only grow large but they also develop, because they also improve in their functions. Development can be defined as, “the emerging and expanding of capacities of the individual to provide greater facilities in functioning such as development of motor ability from uncertain step to proficiency in games. Development as a matter of fact is achieved through growth.”

#### **5.4.1 Definitions of Development**

##### **Boring**

“By the term development, we mean the changes in the shape of the parts of the body and the integration of the various parts into functioning units as growth goes on.”

Thus, the terms growth and development, both imply changes in one’s behaviour and personality make up. Development related to the overall changes, structural as well as functional, carries a comprehensive meaning and consequently we would prefer to describe the trends of changes during the life span of an individual in various dimensions of personality as well as discussing the principles and theories to highlight the pattern and mechanism of these changes.

## 5.5 STAGES OF GROWTH AND DEVELOPMENT

As pointed earlier, life's journey begins with conception in the womb of the mother. The approximate nine month period spent in mother's womb is known as pre-natal period. A child is said to be born when it (fetus) emerges from the internal environment (womb) and has its first contact with the external environment. It is called the post-natal period – and is in fact the beginning of computation of chronological age. The period between the birth and two years – is called the infancy period followed by the phase of childhood lasting for about 10 to 12 years. This is followed by a period of adolescent when one attains puberty (sexual maturity) and is capable of reproduction.

**Table : Age Span for Human Development Stages**

<b>Period or stages of development</b>	<b>Approximate age</b>
1. Infancy	From birth to 2 years.
2. Childhood	From 3 <sup>rd</sup> year to 6 years.
(a) Pre-childhood	From 3 <sup>rd</sup> year to 12 years.
(b) Later childhood outset of puberty.	From 7 <sup>th</sup> year to 12 years or upto the
3. Adolescence	From 13 <sup>th</sup> year to 19 years or in the strict sense from outset of puberty till the attainment of maturity.
4. Adulthood	From 20 <sup>th</sup> year to 60 years or in a strict sense from attaining maturity to the age one ceases to produce one's own kind.
5. Old age or ageing	From 61 years or in a strict sense from the end of the reproduction capability till death.

Now, we shall discuss these stages of development one by one:-

## **5.6 INFANCY STAGE OF HUMAN DEVELOPMENT**

The period from birth to three years is called infancy. It is a period of ample physical growth involving the most rapid change. The baby's birth weight doubles during the first six months and is trebled by the end of the first year. Brain weight which at birth is about one fourth its weight at adulthood, becomes three fourths of the final size by the end of three years. Infancy occupies a very important place in the life of the child.

### **5.6.1 Physical Development**

#### **(i) Size and Weight**

It is the period of rapid growth in size and weight. The average length of a new born child is 19 inches but it varies from 17 to 21 inches. The average weight of a new born baby is 7 pounds but it is observed that it varies from 3 to 16 pounds. This variability in growth depends on heredity, diet, economic status, order of birth in the family and certain other environmental factors. By the time the child is about 2 years of age, his weight becomes round about 25 pounds and an over all length about 33 inches.

#### **(ii) Changes in Proportion**

Changes in the proportion of the body are now visible. Different parts of the body like head and trunk begin to take proportionate size.

#### **(iii) Bones and Muscles**

There is rapid growth in the bones and muscles. Bones and muscles of the child begin to develop. He starts using his fingers by holding things, sitting, standing, walking and running.

#### **(iv) Teeth**

The first tooth that normally appears in a child is at the age of six months. By the time the child grows one year old four teeth appear. Approximately 16 teeth out of 20 have erupted before the period is over.

**(v) Nervous System**

There is rapid growth of nervous system during this period. The brain grows rapidly. By the end of this period the child is able to perform all the functions of seeing, hearing, tasting, smelling and feeling pleasure and pain etc. Moreover the glands begin to function properly.

**(vi) Digestive System**

Digestive organs of the child are very tender and susceptible to be spoiled if not properly cared.

**5.6.2 Intellectual Development/Mental Development**

By intellectual development we mean the development of language, interests, power of memory, imagination, understanding, reasoning, thinking, intelligence, sensation, perception and problem solving etc. Following are the characteristics of intellectual development:-

**(i) Development of language**

The child at the birth can only cry as an expression of emotion – pleasure or pain. He cries at 6 month's age, indicate his recognition of some new situation. By the first year he may utter a few words — *Aa, Baa, Maa, Paa* etc. It is at 1½ years language development becomes more rapid. At the age of 2 or 3 years, he learns to speak very short sentence which is usually in the form of repetition, Professor Smith is of the opinion that the “child at the age of 1 year is able to seek 3 words, at the age of 2 he is able to speak 272 words and the age of 5, he learns 2072 words”.

**(ii) Interests**

The child in his infancy is interested in only those things which are in connection with immediate needs such as hunger and feeding.

**(iii) Curious Questions**

The child becomes curious and puts such questions as “What is it”? “Why is it so”? “Who has done it”?

**(iv) Fertile Imagination**

The period of infancy is a period of fertile imagination. Day dreaming, fairy tales, fantasy, make – belief play are important parts in the infancy period of the child.

**(v) Sensory development**

In the first month of the life of the child sensory development takes place and thus the child learns to use his senses effectively.

**(vi) Concepts, percepts and thoughts**

Development of concepts and percepts begins at this stage. He is able to judge distances when he runs, walks and climbs. He is able to organize his thoughts and make simple generalizations though all these are very rudimentary. At the age of 5, he is capable of reasoning and thinking.

**5.6.3 Emotional Development**

Components of emotional experience include feelings, impulses and physical and physiological reactions. The development of emotional behaviour parallels and is inter-related with other aspects of child's growth. Some of the characteristics of emotional development during the infancy period are:-

(i) The emotions of the child are not specific at birth. He cannot show specific emotions like hunger, fear and joy as the adults do. As the child attains the age of 2, there is differentiation of emotions.

**(ii) Anger**

Anger is the most common emotion at this stage. It is aroused when adult's force is used to restrict the freedom of the child.

(iii) Emotion of joy is also shown by children at this stage. They express it when they see familiar faces.

(iv) Emotion of affection is also visible. Infants show affection for parents and nurses.

(v) J.B. Waston believes that three important emotions of fear, anger and love can be identified even in infancy period.

- (vi) From 2 to 5 years the child is highly emotional and emotions begin to show themselves up in differentiated form.
- (vii) The chief characteristic of emotion in early childhood (2 to 5) is that the emotions are spontaneous and the child cannot control them.

#### **5.6.4 Social Development**

- (i) During the first days of life the child shows little behaviour that can be called “Social” but from the beginning his everyday experiences and his daily survival are rooted in associations with other persons.
- (ii) The child is fully dependent on parents for physiological and psychological needs. Up to 2 years, social relationships of child are strictly restricted to his home.
- (iii) At 3 years, child shows more desire to play with other children. It is known as social play. The size of play group increases with age from 2 members at 3 years to 3 or 4 members at 6 years.
- (iv) At four, children talk at length, call names, fight and tattle.
- (v) At five, friendship is strong and fighting is less.

Throughout the period of infancy, including early childhood (from 0 to 5) the child is self-centred in his social behaviour.

#### **5.6.5 Educational Provisions**

A young mother asked Sir William Ostler, “At what age should I start the education of my child.” Sir Ostler asked the lady, “How old is your child.” Her answer was “Two years.”

**Sir Ostler, “Then you are already late.”**

It is clearly suggested by Sir Ostler that education of an infant begins very early. Every father and every mother wants that his or her child should grow up, from the very beginning, in an atmosphere conducive to the formation of a brighter career for the child. The psychologists like Sir George Newman, Adler and Sigmund Freud are of the view that first five years of life form an extremely sensitive period both for the body and for the mind.

This fact highlighted by psychologists confirms the truth of the famous adage – ‘child is the father of man.’

In the first two and half years the child should be given practical knowledge. The child’s health must be given fullest attention. Children should be brought up in a peaceful environment. As soon as child is capable of sitting up, he should be given complete freedom and should be allowed to play with toys. The child should not be scolded. Roughly speaking, the education of a child begins from two and half to five years. It is necessary, to send the child to some institution providing – nursery, basic or kindergarten education. At home, the following facilities should be made available to the child:-

**(i) Creativity :**

Children should be taught songs, activities and interests not connected with curricular activities of the school.

**(ii) Expression :**

At this stage children have a natural tendency to give independent expression to their own thoughts and feelings. Paper, wood and clay can be used in many creative activities. Children can be taught many useful things through playful songs, nursery rhymes and stories.

**(iii) Alphabets :**

Simple knowledge of letters should be given to the child at this stage. Many interesting games, based on alphabets can be used.

**(iv) Role of teacher :**

In infancy, the teacher has a very great responsibility. If the teacher keeps above facts in mind the child will develop adequately.

**CHECK YOUR PROGRESS - 1**

Notes: (a) Give your answers in the space given below:

(b) Compare your answers with those given at the end of the lesson.

(A). What do you mean by Growth.

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(B). Define the term Development.

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(C). Name various physical characteristics of Infancy stage of human growth and development.

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(D). Explain briefly educational provisions for infancy stage.

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### **5.7 CHILDHOOD STAGE OF DEVELOPMENT**

The period from three to six years, termed as early childhood, is the age of maximum mental development. Late childhood is the intervening period between childhood and adolescence. This period starts at age of 5 and ends at 12 years of age. It begins with the entrance to the school and ends with the onset of puberty. During this period many physical, intellectual, emotional and social changes takes place.

### **5.7.1 Physical Development**

#### **(i) Height and Weight**

The period of childhood is characterized as the period of slow, steady and uniform growth. The child at age of 12 is about 56 inches in height and 85 pounds in weight.

#### **(ii) Bodily proportions**

Bodily proportions change considerably and alter the overall appearance of the child. The nose becomes larger and the lower jaw also increases in size. Arms, legs and trunk increase in length and the period of thinness begins. This rather gives “an ugly outlook” to the child.

#### **(iii) Growth and co-ordination of muscles**

There is rapid and greater muscular growth during the period. The child builds up finer muscular co-ordination and improves many muscular and motor skills.

#### **(iv) Teeth**

It is during this period that the teeth of childhood starts falling and the permanent teeth start growing.

#### **(v) Nervous System**

During this period growth of nervous system proceeds at a relatively slow rate whereas during the period of infancy, the growth of nervous system proceeds at a relatively rapid rate.

#### **(vi) Sense organs and Motor organs**

During this period the sense organs and motor organs of the child assume complete development process.

#### **(vii) Digestive System**

Digestive System of a child is very tender and susceptible to be spoiled if not properly taken care of.

**(viii) Sex differences**

It is during this period that sex differences influence the physical growth. A girl is taller on an average by half an inch and weighs more on an average by 3 pounds than a boy.

**5.7.2 Intellectual Development**

Late childhood is the period of intellectual advancement, where new experiences are acquired and applied and mental horizon is broadened.

**(i) Language development**

The mental growth curve rises more rapidly both in terms vocabulary and in the use of such parts of speech as adverbs, prepositions and conjunctions.

**(ii) Curious questions**

The child tries to put curious questions to his elders and parents and tries to get answers from them. The child forms concepts, absorbs experiences, begins to read, develops ideas of right and wrong and begins to develop conscience.

**(iii) Development of interests**

During this period interests of the child expand. He likes books about travel, biography, science, adventure, fairy, tales of crime, mystery and romance.

**5.7.3 Emotional Development**

**(i) Intense Individualism**

It is also a period of intense individualism which results in a tendency to react against other's suggestions. He realizes himself to be a separate individual and uses prominently pronouns such as I, me and you.

**(ii) Sex Identity**

An important acquisition of this stage is an acceptable sex identity. It is the realization that I am a boy or I am a girl. Learning sex differences and sexual modesty are also the characteristics of this process of emotional development.

**(iii) Emotional expression**

The child refines his expression of anger or fear as he moves through this stage. As the child grows older, changes occur in emotional expression and the ways in which emotional reactions are aroused.

**(iv) Formation of Sentiments and Complexes**

Generally it is at this stage that sentiments and complexes are formed.

**(v) Stability and Control**

This is a period of stability and control. The child now comes to have a control over his emotions. His emotional behaviour is guided by rational expression.

**5.7.4 Social Development**

(i) According to Crow and Crow (1969, p.115), the main characteristics of social development during this stage are manifested by the child by imitating other children's actions and words, seeking their approval and help, giving up toys for them, waiting for his turn while playing amongst them, pointing out their errors, helping them, comforting those in distress, joining them in play or in trouble and stopping work to aid another child.

**(ii) Group adjustability**

The child learns to adjust himself in a group. He learns to co-operate with others. He also learns to prefer group interest to self-interest. Group loyalties grow and the child gets opportunities to obey and command.

(iii) The child can plan his own activities and organize his own play. Thus the social qualities of initiative, organization and co-ordination develop in him.

(iv) Children show consciousness of the socio-economic status of the parents. It results into many prejudices and differences.

**5.7.5 Educational Provisions**

In childhood, the child's behaviour assumes a definite, distinct form. Hence, in educating the child in this stage, following points must be borne in mind:-

- (i) Education should conform to and be capable of fulfilling the physical, mental, emotional and other needs of the child.
- (ii) Teacher's behaviour play an important role in this stage to the child's education. A teacher's misbehaviour or stern behaviour can lead to the birth of many complexes in the child's mind and these lead to abnormalities and maladjustment.
- (iii) Teachers should take the work of education forward, keeping in the mind the very important fact of individual differences.
- (iv) Reading and writing should be practiced with the help of simple and attractive books.
- (v) Since the imagination develops very quickly in this period, stories become an inseparable part of the interests of children. Children can be told stories about great men and the incidents of their childhood.
- (vi) It is necessary to give children knowledge of colours, form, size, materials, motion, direction and activities requiring bodily movement.
- (vii) In this stage, it is important to develop the habit of cultured speech in children. They should be trained to send greeting cards to friends on birthdays, to give presents, to take flowers for the teacher while going to school, etc.
- (viii) Creative education combined with emphasis upon manual skill is essential in this period.

### **CHECK YOU PROGRESS -2**

Notes: (a) Give your answers as instructed in each question.

(b) Compare your answers with those given at the end of the lesson.

(A) Fill in the blanks with suitable words:-

(i) Early childhood stage is the period from \_\_\_\_\_ to \_\_\_\_\_ years.

(ii) The child at the age of 12 is about \_\_\_\_\_ inches in height and \_\_\_\_\_ pounds in weight.

- (iii) The tendency of the child to react against other's suggestions is a period of \_\_\_\_\_.
- (iv) The child learns to adjust himself in a group. It is known as group \_\_\_\_\_.
- (v) Education should focus on fulfilling the physical, mental and \_\_\_\_\_ needs of the child.

(B) Write your answers in the space given below:

- (a) Explain intellectual development during childhood stage.

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- (b) What do you mean by social development.

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## 5.8 ADOLESCENT STAGE OF HUMAN DEVELOPMENT

The period from twelve to fifteen years is called adolescence and marks the beginning of social adjustment. The term "Adolescent" comes from the word "Adolescence" which means to grow or to grow to maturity. It is the period of great stress and strain. This period is between childhood and adulthood. This period emerges from childhood and merges into adulthood. It is a period of revolutionary change. **Stanley Hall** has regarded adolescence as, "period of great stress and strain, storm and strife." **Bigge and Hunt** have remarked, "The one word which best characterizes adolescence is 'change'. The change is physiological, sociological and psychological."

### 5.8.1 Physical Development

In the words of Hollingworth, "The wise spread myth is that every child is changing, who at puberty comes forth as a different personality doubtless a survival in Folklore."

Following are the characteristics of adolescent period :-

**(i) Increase in height and weight**

Adolescents grow very rapidly so far as their height is concerned but there are sex differences. Boys grow taller in comparison to girls. Along with the growth in height, change in weight also takes place. There are sex differences in this regard also. Generally girls become heavier than boys at the approximate age of 13 or 14 years and boys become heavier than girls after the age of 15 or 16 years.

**(ii) Change in Voice**

Change in voice is more notable in case of boys rather than girls. Voice of boys tend to become more harsh and heavy whereas girls generally become sweeter and gentler.

**(iii) Change in hair growth**

The most immediately noticeable change in adolescents is the appearance of hair on various parts of the body such as armpits, loins, chest, chin etc. Hair does not grow on the chest and chin of girls but in exceptional cases girls with beards and moustaches can be seen which is due to malfunctioning of ductless glands.

**(iv) Changes in Physiological System**

The internal physiological systems of the body undergo rapid changes. Following physiological systems of the body are involved in this regard viz. respiratory system, digestive system, circulatory system, blood pressure, heart and pulse rate.

**(v) Changes in body parts**

A very important contribution of the period of adolescence is the maturation of the reproductive organs of boys and girls. The gonads glands begin their function and capacity to reproduce emerges in both the sexes. Girls undergo rapid and marked physical changes in this period. Their breasts begin to grow and announces to arrival of puberty. In boys, too, some individuals find an enlargement of their nipples. The arrival of complete adolescence in girls is marked by the occurrence of menstruation. In case of boys, the first nightfall or nightly emission of semen is

the sign of adolescence.

**(vi) Changes in Motor performance**

Physical development leads to increased motor performance both in cases of boys as well as girls but there are great differences in the motor performance of boys and girls. The boys excel girls in those motor activities which involve speed and muscular strength.

**5.8.2 Mental Development/Intellectual Development**

In adolescence, the mental development of the child requires proper guidance. At this stage parents and teachers must fulfill the very important responsibility of giving a sense of direction to the child after determining the level of adolescents mental growth. In adolescents, mental growth is indicated by the following factors:-

**(i) Concentration**

In adolescence, the individual develops the capacity to concentrate attention upon any object or subject and to indulge in abstract thinking.

**(ii) Retention**

The adolescent has a developed memory and the capacity for permanent retention also increases. Girls usually develop a superior capacity to cram as compared to boys.

**(iii) Imagination**

In this stage imagination develops considerably and due to this the adolescent develops his internal powers. Logical thinking develops and they refuse to accept anything illogical.

**(iv) Different inclinations**

In this stage, girls and boys have different inclinations towards games. Boys prefer mass or group games whereas girls manifest interest in songs, dance, dramatics, music etc.

**(v) Exhibition**

In adolescence, the desire to exhibit one's body also manifests itself. Boys try to make their bodies as muscular as possible while girls turn towards beautification and the use of cosmetics.

**(vi) Reading habits**

Interest in independent reading also develops in this stage. Boys usually turn towards books on scientific literature, humour, patriotism, adventure or sexual exploits. Girls take interest in romances and read romantic literature.

**Some other mental characteristics are:-**

- (i) Interest in music and movies.
- (ii) Development of problem solving ability.
- (iii) Development of generalization ability.
- (iv) Development of decision making ability.

**5.8.3 Emotional Development**

Emotions are of paramount importance in human life. If an individual's emotions do not develop in a balanced manner, the individual's entire personality becomes disorganized and many distortions manifest themselves. Adolescents are very much emotional, sometimes they become intensely excited and sometimes deeply depressed.

According to Ross, "an adolescent lives an intensely emotional life in which we can see the system of positive and negative phases of behaviour in his constant behavioural fluctuation between intense excitement and deep depression."

Adolescent period is influenced by following emotional characteristics:-

**(i) Heightening of emotions**

The emotions of the adolescents are on the extremes. Heightened emotions are evident from nail biting, tension conflicts, quarrels with parents, sibling and classmates.

**(ii) Variations in emotional moods:**

Emotional moods of adolescents vary from elation to depression. One minute the young adolescent is up in the clouds and the next he is in depth of despair.

**(iii) Emotion of love**

Love is one of the most dominant emotions of adolescent period. This is due to the development of sex instinct which takes place during this period.

**(iv) Emotion of anger**

The adolescent is made angry when he is teased, ridiculed, criticized or 'lectured' when he feels that he and his friends are unfairly treated or punished by parents and teachers, when privileges he considers fair or refused or when he is treated like a child.

**(v) Complexity of emotions**

Emotional development of an adolescent becomes very complex and sometimes uncontrollable due to the experiences they get in their social environment.

Emotional characteristics of adolescents can be summed up in Winifred V. Richmond's words, "The restlessness, the changing moods, the flaming enthusiasm, the romantic fantasies, tendency to day dreaming, the self conceit and self assertion. Characteristics of the girl in her teens arise from the deepest recess of her nature. Adolescence is the hey day of emotional life, the blossom time of all those feelings and emotions which depend at bottom upon sex."

#### **5.8.4 Social Development**

In adolescence, the child's social development comes under the influence of his interests, needs, sense of security or insecurity, etc. Social development develops group loyalty and encourages mutual dependence, co-operation and togetherness. Following are the social characteristics of adolescents:-

**(i) Similarity of objectives**

Similarity of objectives in adolescence leads to the birth of firm and permanent

friendships. However in forming friendships, adolescents keep in mind interests, aptitudes and social and economic status.

**(ii) Social acceptability**

Adolescents become aware of the fact that they have social acceptability at some places but not at others.

**(iii) Sex drive**

Because of the powerful manifestation of the sex drive in adolescence, girls and boys like to meet and talk to each other and to participate jointly in social activities.

**(iv) Sociability**

Sociability develops to such an extent in adolescents that they are usually eager to make sacrifices for the honour and dignity of their friends. For this purpose, they obey every command given by the leader of the group.

**(v) Social awareness**

Social awareness grows at a rapid pace in the adolescents. The adolescent wants to win praise from his parents. He easily become annoyed and insists upon the fulfillment of his wish, his behaviour is characterized by selfishness.

**(vi) Leadership qualities**

Endeavour for leadership is another social characteristic of adolescence. The adolescents who opt for social leadership develop the qualities of self-confidence, decision making power, sense of humour, self-insight as well as social insight.

**5.8.5 Educational Provisions**

The education of adolescents is as complex as they themselves are. Giving education to the adolescents in the right direction is essential for national development and well adjusted adolescents. Following are important to overcome the problems of adolescents:-

**(i) Physical Exercises and Activities**

Adolescence being a period of rapid physical development, physical exercises and activities

like sports, drill, games, dancing, hiking, gymnastics, wrestling, football, kabaddi etc. should be introduced in school curriculum.

(ii) Appropriate Lectures on Sex Education

Appropriate lectures on physical growth and development should be delivered on scientific grounds. Sex education should be given in free, frank, scientific, judicious and impersonal manner.

(iii) Method of teaching

Teachers should understand the need of the adolescents and adopt method of teaching conforming to the nature of adolescents. It is necessary to adopt the path of harmony and synthesis.

(iv) Career Counselling

The problem of future career often haunts adolescents. They should be provided adequate and satisfactory guidance in this regard. Educational system should cater to the basic demand of the individual for whom it is meant.

(v) Co-curricular Activities

Adolescence is a period of intellectual development. Scouting, games, travel etc. should be made an essential part of teaching. Opportunities should be given for self expression, debates, paper reading contests, N.C.C., N.S.S., music and dramatic clubs etc. can be employed to give constructive turn to adolescent's mind.

(vi) Moral and Religious Education

Moral and religious education should be given to adolescents. Spirit of brotherhood should be taught, propagated and cultivated.

### CHECK YOUR PROGRESS - 3

Notes: (a) Give your answers as instructed in each question.

(b) Compare your answers with those given at the end of the lesson.

(A) Choose the most appropriate answer out of four options given against every question.

**(i) Which one of the following is not a feature of physical development.**

(a) Increase in height and weight (b) Concentration

(c) Change in physiological system (d) Change in voice.

**(ii) Who said, “Adolescent is a period of great stress and strain, storm and strife?”**

(a) Ross (b) Crow & Crow

(c) Stanley Hall (d) Drever.

**(iii) Adolescent period is influenced by following emotional characteristics:**

(a) Heightening of emotions (b) Emotion of love

(c) Emotion of anger (d) All the above.

**(iv) Which one of the following is a characteristic of social development:**

(a) Physical Exercises (b) Career counselling

(c) Leadership qualities (d) Moral and religious education

### 5.9 LET US SUM UP

In this unit you have studied the concept of growth and development and various stages of human growth and development. The stages of human development like infancy, childhood and adolescence are discussed in detail with special reference to physical development, Intellectual development, Emotional developments and social development. Educational provisions for all stages of development are also discussed in detail. The development of child during infancy stage takes place at a very rapid rate. Hence the

environment of the child should be healthy and good for the development of child. Childhood stage of development plays an important role in the development of the personality of an individual. In order to establish an ideal society parents, teachers, psychologists and educationalists will have to build up competent and able children. Adolescence is a period of stress and strain, heightened emotionality, day dreaming and adventures, intense affections and stirring of the heart. Teachers have to play an important role in the education of adolescents so that they can face and solve the problems of life.

### **5.10 MODEL EXAMINATION QUESTIONS**

1. Discuss the concept of growth and development.
2. What are the features of physical and social development of infancy stage.
3. Explain the emotional and social development of adolescents. How will you manage the education of adolescents.
4. Compare emotional development during childhood and adolescence.
5. Discuss the characteristics of Mental development during adolescence.

### **5.11 SUGGESTED READING**

- (i) Craig J. Grace (1983): Human development, Prentice hall, INC., Englewood cliffs, New Jersey.
- (ii) Damral, B.D (2004): Foundations of Educational Psychology, Published by Radha Krishan Anand and Co. Jammu (J&K)
- (iii) Panda, B.N (1999): Advanced Educational Psychology, Discovery Publishing House, New Delhi.
- (iv) Skinner, C.E. (1984): Educational Psychology, Prentice Hall, INC, Englewood cliffs, New Jersey.
- (v) Saxena and Bhatnagar (2001): Advanced Educational Psychology, published by Surya Publications, Meerut.
- (vi) Walia, J.S. (1988): Foundation of educational Psychology, Paul Publisher, Jalandhar city (Punjab).

## **5.12 ANSWERS TO CHECK YOUR PROGRESS**

1. (A) Refer to 5.3 and 5.3.1  
(B) Refer to 5.4 and 5.4.1  
(C) Refer to 5.6.1  
(D) Refer to 5.6.5
- 2.A. (i) 3 to 6 years  
(ii) 56 and 85  
(iii) Intense individualism  
(iv) Adjustability  
(v) Emotional
- B. (a) Refer to 5.7.2  
(b) Refer to 5.7.4
- 3.A. (i) Concentration  
(ii) Stanley Hall  
(iii) All the above  
(iv) Leadership qualities.

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**INTELLECTUAL DEVELOPMENT DURING INFANCY, CHILDHOOD  
AND ADOLESCENCE AS A STAGE OF HUMAN DEVELOPMENT**

**6.0 STRUCTURE**

6.1 Objectives

6.2 Infancy Period

1.2.1 Intellectual development during Infancy Period

6.3 Childhood Period

1.3.1 Intellectual development during Childhood Period.

6.4 Adolescence

1.4.1 Intellectual development during Adolescence

6.5 Let Us Sum Up

6.6 Check Your Progress

6.7 Suggested Further Readings

**6.1 OBJECTIVES**

After going through this topic, you are expected to

- Discuss the intellectual development during infancy period.
- Discuss the intellectual development during childhood period.
- Discuss the adolescence stage and its intellectual development

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*Ms. Puneet Kour, Assistant Prof. in Education, DDE, University of Jammu*

## 6.2 INFANCY PERIOD

Age of infancy is marked by an increase of independence on the part of the baby as he is able to sit, stand and walk at his own will. The basic foundations of physical, mental and personality development are laid in this stage. Psychoanalysts too, stress the importance of infancy. According to Adler infancy prepares the style of life. It lays down the entire programme for the further life of the child. Freud is also of the opinion that within 4 or 5 years the child becomes what he has to grow in the coming life. In short, it can be said that infancy occupies a very important place in the life of the child. Hurlock calls it a “dangerous age” referring to a large number of deaths of children in this period. She labels this age as an ‘appealing age’ since the helplessness of the child appeals and pleases many adults particularly the poets and the artists.

### 6.2.1 INTELLECTUAL DEVELOPMENT DURING INFANCY PERIOD

Some of the characteristics of intellectual development of this stage are :

By intellectual development we mean the development of language, interests, power of memory, imagination, understanding, reasoning, thinking, intelligence, sensation, perception and problems.

- 1. Development of Language :** The child at birth can only cry as an expression of emotion – pleasure or pain. His cries at 6 month’s age, indicate his recognition of some new situation. By the first year, he may utter a few words – Aa, Baa, Maa, Paa etc. It is at 18 months that language development becomes more rapid. At the age of 2 or 3 years, he learns to speak very short sentence which are usually in the form of representation of what the elders have said. Professor Smith is of the opinion that the child at the age of 1 year is able to speak 3 words, at the age of 2, he is able to speak 272 words and at the age of 5, he learns 2072 words.
- 2. Interests :** The child in his infancy is interested in only those things which are in connection with immediate needs such as hunger and feeding. Slowly his horizon to looking at things widens. He becomes

interested in bright, jingling and moving toys.

3. **Curious Questions :** The child becomes curious and puts such question as, “What is it?”, “Why is it so ?” “Who has done it ?” etc.
4. **Fertile Imagination :** The period of infancy is a period of fertile imagination. Day dreaming, fairy, tales, fantasy, make believe play are important features in the infancy period of the child. The child thinks that his imaginary world is a real world. At this stage, it is necessary to give due regard and recognition to the imagination of the child.
5. **Sensory development :** In the first month of the life of the child, sensory development takes place and thus the child learns to use his senses effectively. The child experiences many types of sensation like hardness, pleasure, pain, sensation of sounds, smell. He can compare various sensations.
6. **Concepts, percepts and thoughts :** Development of concepts and percepts begins at this stage. He is able to judge distances when he runs, walks and climbs. He is able to organize his thought and make simple generalizations though all these are very rudimentary.

### 6.3 CHILDHOOD PERIOD

Childhood or pre-adolescence is the intervening period between childhood and adolescence. This period starts at the age of 5 and ends at the age of 12 years. This period is marked by significant changes because the child leaves his world of fancy and make believe behind and enters the world of reality. During this period, many physical and psychological changes and development of the child widens during the period and his social and moral development starts. This period is made rich by varied experience of things and persons.

#### 6.3.1 INTELLECTUAL DEVELOPMENT DURING CHILDHOOD PERIOD

Late childhood is the period of intellectual development where new experiences are acquired and applied and mental horizon is broadened.

1. **Language development :** By the time the child is 12, his vocabulary

is sufficiently rich. He can speak sentences fully well. He begins to use simple idioms. The favourite topics of discussion are day to day experiences, sex, girls, etc. He accumulates a large amount of knowledge and information.

2. **Curious questions :** The child tries to put curious questions to his elders and parents and tries to get answers from them. These questions are more definite than he used to put during his infancy.
3. **Development of power of thinking and sensory equipment :** During this period, alongwith curiosity power of observation, reasoning, remembering, recalling, attention and thinking develops. If during the infancy the child wants to know what is this ? then in the late childhood he tries to know – why is this so ?-then in the late childhood he tries to know-why is this so?

His sensory equipment becomes well developed. His power of perception becomes keener and more accurate. His vivid memory gives place to logical thinking and he can generalise on the basis of his experience.

4. **Import of reality into the world of imagination :** During this period, the child realizes that the world of reality is the real world for him. He ceases to live in the world of imagination.
5. **Development of concepts :** Child develops the concept of time fully. He also develops an idea of length and distance.
6. **Development of Interests :** During this period, interests of the child expand. He likes books about travel, biography, science, adventure, fairy tales, mystery and romance. Interest in collection reaches a peak through this period. Radio and movies hold a strong appeal for him.

#### 6.4 ADOLESCENCE

Adolescence refers to the period of development and adjustment during the transitional period between childhood and adulthood. This period emerges from childhood and merges into adulthood. During this period, the establishment

of childhood goes away and a revolutionary process of change starts. In fact, it is period of revolutionary change. It is markedly a period of growing up, during which the child develops into a man or a woman.

#### **6.4.1 INTELLECTUAL DEVELOPMENT DURING ADOLESCENCE**

Adolescents, generally, show the following intellectual characteristics and changes.

- 1. Development of intelligence :** Adolescence is the period of maximum growth and intellectual development. Intelligence reaches its climax during this period. Intellectual powers like logical thinking, abstract reasoning and concentration are almost developed into the end of this period. An adolescent learns to reason and seeks answers to ‘how and why’ of everything scientifically.
- 2. Increase in span of attention :** During adolescent period, the span of attention increases. The adolescent can attend to one thing for a longer period of time. His power of concentration is increased.
- 3. Development of memory :** Memory is also developed and it tends to function more logically. It is better than any other stage.
- 4. Development of understanding :** The depth of understanding develops. Consequently adolescents try to see and analyse essential relationships in the situation.
- 5. Development of abstract thinking :** There is sudden development of abstract thinking and to deal with abstract ideas. Now adolescents start thinking in terms of concepts and symbols rather than concrete things.
- 6. Development of generalization :** Adolescents have ability to generalize in abstract terms. During childhood, there exists ability of generalization in relation to concrete objects but during adolescence, there exists ability to generalize in relation to concepts and ideas.
- 7. Development of problem solving ability :** The adolescents try to solve problems on their own whenever they are confronted with some problematic situations. They avoid looking towards others and prefer to use their own intellectual powers.

8. **Ability to make decisions** : Adolescents develop ability to make decisions. They learn to distinguish between actual and ideal, between reasoning and rationalization. They learn to shift what is wished for from what is wise.
9. **Development of imagination** : Adolescents possess excessive imagination. Writers, artists, musicians, poets, philosophers and inventors are born in this period. Improper channelisation of imagination and dissatisfied needs may turn an adolescent into day dreaming. He builds castles in the air.
10. **Hero-Worship** : Hero worship is very prominent in adolescent period. An adolescent begins to worship his ideal man or woman and tries to model himself on him or her. Once a hero is selected, the adolescent tries to follow him or her blindly. He selects the hero through the study of various biographies or stories of national or international heroes or tales of adventure. It is, therefore, suggested that the child should be helped in selecting a hero because it becomes difficult to change his life once he happens to select an unhealthy hero like a dacoit and guide his conduct for a number of years.

## 6.5 LET US SUM-UP

Infancy, childhood and adolescence are the different stages of human development.

It is the duty of the parents and teachers to provide proper atmosphere and facilities for the proper development and education of the child. Curricular and Co-curricular activities should be provided by the school so that children develop proper attitude towards social, emotional, physical and intellectual development. The teacher has to see that a child becomes physically fit, socially adjusted emotionally stable and intellectually advanced and morally developed.

## 6.6 CHECK YOUR PROGRESS

1. Explain the intellectual development during the infancy period.
2. Discuss the intellectual development during childhood period.
3. Discuss the adolescence stage and its intellectual development.

## **6.7 SUGGESTED FURTHER READINGS**

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2. Mathur, S.S. (Prof. Kumann University) : Psychological Foundations of Education, Revised Edition 1996.
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4. Panda, B.N. (1999), Advanced Educational Psychology, Discovery Publishing House, New Delhi.
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**SPECIAL CHILDREN, CATEGORIES AND EDUCATIONAL PROVISIONS**

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## Structure

- 7.1 Introduction
- 7.2 Objectives
- 7.3 Meaning of special children
- 7.4 Categories/Types of special children
- 7.5 Educational Provisions for Special Children
- 7.6 Let Us Sum Up
- 7.7 Unit-end Exercises
- 7.8 Suggested Readings

**7.1 Introduction :-**

What is it like to be a "special child"? There are probably as many answers to this question- as there are special children. Being a child is a very personal affair; this is no less true for the special child. The unique experiences of one's own childhood lie at the very roots of each person's individual being. For most of us, childhood seems a wondrous and mysterious phenomenon of human experience: a time of growth, a time of learning and unlimited potential, a time of fantasy and play, a time of living in one's mind the many things that one will let become. For some, childhood can also seem a time of frustration, a time of confinement, a time of disappointment. For special children, the latter can often be the case.

## **7.2 Objectives :After going through this lesson you will be able to :**

- Define special children;
- Identify the different types of special children;
- Understand the needs of different types of special children;
- Analyse the effect of educational provisions on different types of special children

## **7.3 Meaning of special children :**

In a philosophical and humanitarian sense, all children are special. However, in this text, we are concerned with special kinds of children who are significantly different from other children in some important dimension of human functioning. These special children are those for whom the presence of a physical, psychological, cognitive, or social factor makes difficult the realization of their needs and full potential. For these children skilled intervention and special care are needed in order to help them reach their potential. This definition of special children encompasses the deaf, the blind, the speech disabled, the crippled, the mentally retarded, the emotionally disturbed, to mention but a few. Even gifted children with high IQ's must be recognized as special because skilled intervention by trained professionals might well be required for them to develop to their fullest potential, in the case of an intellectually gifted youngster, of course, the child is capable of achieving at a level in advance of what is typically expected of other children; but the realization of this potential is a critical part of such a child's development.

Over the years a number of general terms have been used to refer to special children like "exceptional," "disabled," "handicapped," or "dysfunctioning." In this unit we have chosen to highlight the term "special" because these children are different and they require a particular kind of care and understanding. Psychologists have mostly used the term exceptional children to define special children.

### **Crow and Crow (1973) :**

The term 'a typical' or 'exceptional' is applied to a trait or to a person possessing the trait if the extent of deviation from normal possession of the trait is so great that because of it the individual warrants or receives special attention from his fellows and his behaviour, responses and activities are thereby affected.

**Kirk (1984) :**

An exceptional child is he who deviates from the normal or average child in mental, physical and social characteristics to such an extent that he requires a modification of school practices or special educational services in order to develop to his maximum capacity, or supplementary instruction.

**Telford and Sawrey (1977) :**

The term exceptional children refers to those children who deviate from the normal in physical, mental, emotional, or social characteristics to such a degree that they require special social and educational services to develop their maximum capacity.

These definitions highlight the following typical features or characteristics of the exceptional children :

1. Exceptional/special children are quite different and distinct from the so-called normal or average children.
2. Their deviation from the normal or average children is so great that they can be recognised and distinguished easily from average children.
3. This deviation in terms of their acquired traits or development may fall in any behavioural or developmental dimension- physical, intellectual, emotional or social .
4. The degree of deviation in any behavioural or developmental trait is so marked that these children experience unusual or peculiar problems and require special arrangements in terms of care and education for their proper growth and upbringing to meet the special conditions necessary for the full development and nurturing of their capabilities.

**7.4 Categories/ Types of special children**

Special children are of various types such as the following :

- Children with Hearing Handicap

- Children with Visual Handicap
- Children with Mental Retardation
- Children with Learning Disability
- Children with Orthopaedic Handicap
- Children with Emotional Disturbance
- Children with Special Health Problems
- Children with Multiple Handicaps
- Gifted Children
- Creative Children
- Socially Disadvantaged Children

**Children with Hearing Handicap :** The hearing handicapped are those children who have a damaged hearing mechanism and face difficulty in speech and language development. There is loss of hearing. The degree of hearing loss is less in some children while it is more severe in others. The hearing handicapped children may be hard-of-hearing or deaf.

The hard-of-hearing children are those children who have hearing loss but who can hear if spoken too loudly without a hearing aid. A hearing aid will enable them to hear better. For such children education in general schools in common with other children is not difficult. Most of them are already studying in the general classroom. The deaf are those who cannot hear even if spoken to very loudly. They require preparation in basic skills through special techniques before they are admitted in general schools. Children with hearing impairment need hearing aid, auditory training, more of visual cues in the teaching-learning situation, services of audiologist, ENT specialists, special education and other supportive aids and services. The special needs of such children differ depending upon the type and nature of hearing loss, the quality of previous training received in the home and pre-school centres .

**Children with Visual Handicap :** The visually handicapped children are those

who have problems with vision. Some visually handicapped children can read large print and are functional in their environment whereas some have severe vision loss and cannot be taught through visual methods. The visual loss is measured with the help of Snellen Chart. Depending upon the degree of loss they may be partially sighted or blind. The partially sighted are those who require large print or magnified print materials. Their visual acuity (sharpness of visual image) is very low (20/70 in the better eye). This means that the child can see at 20 ft. distance what a normal child sees at 70 ft. Their eye-sight may be weak due to short sightedness, long sightedness, astigmatism, glaucoma or muscle detachment. The blind are those who need to be taught through braille or through aural method. Their visual acuity may fall at 20/200. Such children must be prepared in pre-academic skills like braille reading, braille writing and use of cane for mobility before they are admitted in general schools. They need orientation training, mobility training and more of oral instruction depending upon the degree of loss of vision.

**Children with Mental Retardation :** Mentally retarded children are those who have a lower level of intellectual functioning and have problems in social adaptability. There are various degrees of mental handicap. Consequently there are various categories of mentally handicapped children — the educable mentally retarded (EMR), the trainable mentally retarded (TMR) and the custodial mentally retarded (CMR). The educable mentally retarded are those who have minimum educational retardation in school subjects. Such children have problems of social adjustment, but are usually not recognised as mentally retarded at the pre-school level. They need repetition of instruction. The adaptive behaviours of such children should be observed carefully by the teachers so that they can be identified in the early stages. The trainable mentally retarded can be trained in vocational areas. They are poor in adaptive behaviour and may need training in daily living skills at the initial levels. The custodial mentally retarded need help in developing daily living skills. They are very poor in adaptive behaviour. They need constant care and attention.

**Children with Learning Disability :** These children are like other children in intellectual functioning. They are not mentally retarded, nor do they have visual or hearing problems. But they have problems in spelling, reading, writing, arithmetic, listening and comprehension. Their problem may be due to cerebral dysfunction/emotional/behavioural disturbance, but it is not due to mental retardation, sensory handicap or instructional practices.

Depending upon the degree of disability such children may be categorised into mild learning disabled and severe learning disabled. Such children have a severe discrepancy between their achievement and intellectual ability. Such children may have the following specific problems: reading disability, writing disability, problems in comprehension and communication and problems in numerical ability. Such children need repetition and drill, cognitive modelling, process training, multisensory experiences and remedial instruction.

**Children with Orthopaedic Handicap :** Some children have orthopaedic handicap or locomotor handicap. Locomotor handicap refers to problems with the functioning of bones, joints and muscles. In some cases the problems are so severe that they require artificial limbs to compensate for their crippling conditions. In other cases they need wheel chair or crutches. They need removal of architectural barriers and some environmental modifications in the school. Usually mildly orthopaedically handicapped children do not have learning problems. They can be integrated in the regular school without much difficulty.

**Children with Emotional Disturbance :** Children with emotional disturbance are very often considered as problem children in the school. An emotionally disturbed child has certain inner tensions which create anxiety, frustration, fears and impulsive behaviour. Such a child may find excuses for his inner tensions in some physical difficulty. An emotionally disturbed child may attempt to solve the anxiety by behaving in a premature or childish way, becoming aggressive towards other people, or withdrawing himself to the world of fantasy. Such children need love and protection, security and recognition, pleasant and success experiences in the home and the school.

**Children with Special Health Problems :** Under this category we have children whose poor physical condition makes them inactive and who require special health precautions in school and adequate medical check-ups and support. Such children can be categorised into two groups :Children with mild health problems, and Children with severe health problems. Epilepsy, diabetic problems, asthma and anaemia are some of the special health handicaps.

**Children with Multiple Handicaps :** Multiple handicap refers to more than one handicap in the child. A child may be blind and deaf, blind and orthopaedically handicapped, deaf and orthopaedically handicapped, mentally retarded and orthopaedically handicapped

and so on. In case of multiple handicap one handicap may be primary handicap and the other secondary or one handicap may be more severe than the other handicaps. It is, therefore, important to identify the primary handicap and take measures accordingly. Such children need intensive medical care, superior instruction from the teacher and love and affection from the parents and teachers.

**Gifted Children :** Gifted children are in some way superior in intellectual ability to other children of the same age. Gifted children are those who have demonstrated high ability (including high intelligence), high creativity and high task commitment - a high level of motivation and the ability to see a project through to its conclusion. A variety of terms have been used to describe individuals who are superior in some way such as 'talented', 'creative' and 'genius'. Most of these children remain unidentified in the class. Such children who do not profit much from the regular school programme need early admission in schools, skipping grades, early admission in secondary schools and colleges and enrichment activities and materials.

**Creative Children :** In a school teachers may come across few students who have the ability to produce something new - a composition, a system of ideas or a material or a process which is essentially new or novel, and previously unknown to them. Such children behave differently. They are courageous in their convictions. They have independent thinking and adjustment. They become absorbed and preoccupied in what they are doing. They are curious. They take risks. They are flexible in their opinions. They are intellectually self-confident. The prevailing school practices and situations create hindrance for their creative expressions. Teachers need to modify their attitudes towards such children and employ suitable strategies for promotion of their creativity.

**Socially Disadvantaged Children :** Most teachers encounter a group of children in their classrooms who appear lifeless, incurious, and deceptively unintelligent. They show lack of interest, involvement, and motivation for academic success. They show general academic underachievement. The cumulative deficiencies in learning ultimately lead to their wastage and stagnation. These children are socially, economically and educationally disadvantaged. School readiness programmes in preschool centres, enriched experiences, and remedial instruction are very useful for them.

### **Check Your Progress –I**

1. Explain the meaning of special children.
2. Enlist the various types of special children.

### **7.5 Educational Provisions for Special Children :-**

There are various types of special children. Educational programmes vary from one category to other categories of special children. Here a general discussion on their educational provisions has been made.

**Identification and assessment :** Many special children remain unidentified whether they are in the school or out of school. Consequently they are not able to maximize their potentialities. This calls for early identification of such children. Regular teachers should observe the behavioural characteristics of children suspected to be special and refer them to specialists for medical and psychological assessments.

**Placement services :** After medical and psychological assessment special children are to be placed in a suitable grade in a suitable educational institution. The degree of deviation of a special child and the nature and range of his previous experiences usually determine his placement in an educational institution. For special children following placement programmes can be organised.

- (i) **Full-time placement in a regular classroom :** The least intensive level of special education service is placement of the special child in a regular classroom. The regular classroom teacher is provided with materials, equipment and instructional methods that are appropriate to the special child. At this level, the direct services of experts may not be required. The expertise of the regular classroom teacher may be sufficient to meet the child's needs.
- (ii) **Full-time placement in a regular classroom with special education consultations :** At the next level, the disabled child is a full time student in a regular classroom. The regular teacher has special materials and equipment to

teach the special child. But he may need consultation with the special educator. The special educator instructs the regular teacher for selection and use of special materials, equipment and methods.

- (iii) **Full-time placement in a regular classroom with provision of itinerant special educator service :** Going a step further, the disabled child is a full-time student in a regular classroom. But he gets the services of an itinerant teacher. The itinerant teacher moves from school to school on a planned schedule and works directly with disabled children either individually or in small groups. He provides specialised instruction to the disabled child once or twice in a week and advises the regular teacher in the use of materials, equipment and methods.
- (iv) **Full-time placement in a regular classroom with provision of a resource room/resource teacher :** At the next level, the disabled child is enrolled in the regular classroom. But he receives specialised instruction from a resource teacher in the resource room. The length and frequency of such help depend on the severity of his problems.
- (v) **Part-time placement in regular classroom with part-time placement in a special class :** In this type of service the disabled child is a member of a special classroom. In view of his moderate disability and special needs he receives specialised instruction in academy subjects in a special classroom of the school for a half-day. The resource teacher provides such instruction in the special classroom. The child returns to the regular classroom and participates in regular classroom activities in music, art and physical education in the second half of the day.
- (vi) **Full-time placement in a special class :** This is the type of service usually provided to severely retarded children. In this plan a group of ten to fifteen disabled children belonging to one particular category of disability are enrolled in a special class. These children spend the whole day with the resource teacher in the special classroom being segregated from their normal peers in the school, except during recess, after school activities and school functions.
- (vii) **Full-time placement in special schools :** Special schools provide an all day, segregated experience for disabled children. The special school is usually organised

for a specific category of disabled children. It contains special equipment necessary for their care and education. The children return to their home after the school hour.

- (viii) **Full-time placement in a residential school :** The most restrictive type of services are usually provided in boarding or residential schools. This type of service is usually provided to blind, totally deaf, and profoundly retarded children. In this arrangement disabled children receive twenty four hour care in the boarding school. They are isolated from their parents, siblings and the community. But they can visit their homes during vacation and on weekends. In residential schools children receive academic instruction in addition to training in social skills, communication skills and self-help skills .
- (ix) **Hospital and home-bound instruction :** This involves teaching the handicapped children in the hospital or at home because of their physical and/or psychological conditions. This type of service is most often required for physically handicapped or emotionally disturbed children when no alternative is readily available. Typically, the child is confined to the hospital or his home and the hospital or home-bound teacher maintains contact with the child's regular teacher.

**Emphasis on individuality :** Special children constitute a heterogenous group. There are various categories of special children. Each category of special children has unique characteristics. Again in each category there are various classes of children depending upon their degree of uniqueness. Education of special children should match with their individual characteristics.

**Emphasis on learning :** Since emphasis is being shifted at present from teaching to learning, teachers should teach in the way the child learns best.

**Integrated Setting :** The recent trend in the education of special children is to educate them in common with non-disabled children in general schools.

**Provision of incentives :** Certain incentives for the education of special children like transport allowances, uniform allowances, purchase of books, escort allowances, attendance scholarships is to be made.

**Preparatory classes :** Special children should have some preparation before they receive formal education in a school. Such preparation can be made either in a special school or in anganwadi or preparatory classes in a primary school. For this purpose the teacher should conduct a screening test first, and the administer individual tests, interview parents and their special children to assess what the child knows and can do and what he does not know or what he cannot do. When a child has completed preparation in pre-academic skills, communication skills, daily living skills, mobility training and orientation training then the special child should be encouraged to receive education in a general school in common with others.

**Aids and equipment :** Special children who do not profit from the conventional instructional materials, teaching aids and equipment should be provided with aids and equipment in the resource room keeping in view their special needs. Braille materials, large print materials and magnifying glasses for the visually impaired, hearing aids, speech trainer, and visual materials for the hearing impaired, play and toy materials for the mentally retarded, alternate learning materials for the less abled ones should be made available in schools for proper education of special children.

## **7.6 Let Us Sum Up**

1. Special children are those for whom the presence of a physical, psychological, cognitive, or social factor makes difficult the realization of their needs and full potential. For these children skilled inter-vention and special care are needed .
2. The different categories of special children are-children with hearing handicap, children with visual handicap, children with mental retardation, children with learning disability, children with orthopaedic handicap, children with emotional disturbance, children with special health problems, children with multiple handicaps, gifted children, creative children and socially disadvantaged children.
3. Educational Provisions for Special Children include identification and assessment, various placements ,emphasis on individuality and learning, educating them in common with non-disabled children in general schools, provision of incentives, preparation for receiving education and provision of various aids and appliances required by special children.

### **7.7 Unit End Exercises**

1. Explain the term special children.
2. Why are some children called as special children?
3. Name the different types of special children. Discuss each in details highlighting their needs in educational process.
4. What are the various placement services that are required by special children ?
5. Describe the various educational provisions for special children.

### **7.8 Suggested Reading**

1. Kirk, A. Samuel , Gallagher, J. James and Anastasiow, J. Nicholas (1993) :Educating Exceptional Children,U.S.A.:Houghton Mifflin Company.
2. Mangal,S.K.,(2000) Advanced Educational Psychology,New Delhi:Prentice Hall of India Private Limited.
3. Sharma, R.A.,(2008) :Fundamentals of Special Education,Meerut: Vinay Rakheja c/o R.Lall Book Depot.
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**GIFTED AND CREATIVE CHILDREN**

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**Meaning and definition, Difference between gifted and creative children. Characteristics of gifted children, Identifying gifted children, Educational provisions for gifted children .**

**Structure**

- 8.1 Introduction
- 8.2 Objectives
- 8.3 Meaning and definition of gifted children
- 8.4 Meaning and definition of creative children
- 8.5 Difference between gifted and creative children
- 8.6 Characteristics of gifted children
- 8.7 Identifying gifted children
- 8.8 Educational provisions for gifted children.
- 8.9 Let Us Sum Up
- 8.10 Unit-end Exercises
- 8.11 Suggested Readings

## **8.1 Introduction**

Our study of exceptional children so far has focused on children with intellectual or physical disabilities—children who require special methods and materials to derive maximum benefit from their educational programs. By contrast, the child with unique abilities or talents rarely arouses the same levels of awareness or concern. Frequently, the extremely bright child is taken for granted, or made the subject of unusual demands and pressures for perfect performance when recognition of special abilities does occur. Similarly, the creative child is often viewed as a stubborn nuisance, or as rebellious and arrogant. Special interests or talents in art, music, or athletics are often interpreted as signs of lopsided development by well-meaning parents or teachers. Such pursuits are, therefore, often shunted aside in order to promote "well-balanced" or "normal" development.

As a consequence of these sundry misconceptions and misunderstandings, gifted children have typically received little in the way of special programming to facilitate development of their skills. Instead, they have more often encountered frustration and boredom when placed in situations where teachers nor curriculum offer the challenge they need to develop their full potentials. Such failures may lead to immeasurable loss of talent. In changing society, this problem can only be solved through the intelligent and wise use of technology and sociopolitical structures and through the creative search for ways of improving the quality of life for all its citizens.

In this chapter, we will discuss meaning of gifted and creative children, difference between them and the special characteristics that set gifted students apart from average students. We will explore how the schools attempt to adapt the program to meet the special needs of gifted students, in what ways educational reform movements have been affecting the education of students who are gifted, and what is currently being done to find "hidden giftedness" in our schools to help those gifted students reach a higher level of proficiency.

## **8.2 Objectives: After going through this lesson you will be able to :**

- Define gifted and creative children ;
- Differentiate between gifted and creative children ;

- Discuss the characteristics of gifted and creative children ;
- Understand the need for identifying gifted children ;
- Evaluate the various educational provisions for gifted children and their influence on performance of gifted children.

### **8.3 Meaning and definition of gifted children**

A necessary first step in the study of gifted children is the development of a clear conception of what giftedness means. On one level it seems self-evident that a gifted child is a bright child, one who shows high intelligence or unusual talent. Anyone with eyes and ears can recognize such ability when it is present. However, in order to develop meaningful educational programs for gifted children, clearer definitions are needed so that such children can be identified early and provided with educational experiences that precisely match their needs. Such precision is important so that expectations may be geared to the child's abilities while recognizing the child's limitations. There is little point in making unrealistic demands of even the most talented child, since the only likely outcomes will be anxiety, frustration, resentment, and a damaged self-concept. Furthermore, effective identification is also important in recognizing those children who may give an impression of unusual ability without being able to learn and develop at an accelerated rate. Again, misidentification of normal children as gifted is likely to produce developmental problems. Some definitions of gifted children are given below-

#### **Lewis Terman (1925)**

Gifted are who score in the top 2% on standardized tests of intelligence.

#### **Witty (1958)**

Gifted and talented children are those "whose performance is consistently remarkable in any potentially valuable area".

#### **Renzulli (1978)**

Giftedness consists of an interaction among three basic clusters of human traits—

these clusters being above average general abilities, high levels of task commitment and high levels of creativity. Gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance. Children who manifest or are capable of developing an interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs.

### **Federal legislation (U.S.A)**

Gifted and talented children are those who give evidence of high performance capability in areas such as intellectual, creative, specific academic or leadership ability, or in the performing or visual arts, and who by reason thereof require services or activities not ordinarily provided by the school.

### **8.4 Meaning and definition of creative children**

Creativity, as we use the term, means seeing or expressing new relationship among things or ideas. Every child is creative to some extent in this sense of the term. The amount of creativity and its dimensions vary from individual to individual. Creative children are assets to the society. Development and progress in various fields of national life depends on creative children. We must try to develop creativity in all children so that they may excel in their fields of interest and can lead the nation ahead. Our schools should aim at the development of creativity in school children to prepare leaders in different walks of national life. The school should screen creative children and should provide them all possible facilities for the development of their talents.

According to Guilford creativity involves divergent thinking with respect to the traits of fluency, flexibility and originality of thought processes.

Characteristically, a creative action is novel, exploratory and venturesome spirit on the part of the individual. Uncreative thought is rigid, stereo-typed and mechanically operated. According to Guilford, creative thought means divergent thinking and un-creative means convergent thinking. Convergent thinking is measured by means of intelligence tests which include items like remembering, recognition and manipulation of some concrete material. These traditional tests do not measure the creativity or emergence of originals in children.

Psychologists, in recent years, have recognised the limitations of traditional tests of intelligence to measure the creative ability of children.

Torrence, who has attempted to identify creativity in children, has done a lot of practical work on creativity. He has defined creativity in creative children "as a process of becoming sensitive to problems, deficiencies, gaps of knowledge, missing elements, disharmonies and so on, identifying the difficulties, searching for solutions, making guesses or formulating hypotheses about the deficiencies, testing and retesting hypotheses and possibly modifying and retesting them and finally communicating results." He found that creative children are

- (1) Courageous in convictions. The creative child shows strong conviction in his beliefs and values. He can go beyond socially conformist behaviour.
- (2) Curious. The creative child is curious to know more and more about his environment.
- (3) Independent in judgement. The creative child can take independent judgement in crucial matters.
- (4) Independent in thinking. He is independent in thinking about the problems of various types.
- (5) Becomes pre-occupied with tasks. When he starts a task, he completely absorbs himself in that task. He concentrates all his mental energies on the task in hand.
- (6) Intuitive. He develops intuition in his problems.
- (7) Unwilling to accept say so. He does not easily accept the routine solutions of problems. He is not a conformist.
- (8) Willing to take risk. He has risk taking capacity.
- (9) Visionary. The creative child has vision of future problem. He can anticipate the problems which may emerge in future.

Another attempt to define creativity has been made by Zbigniew Pietrasinski, a Russian psychologist, who emphasizes the social value of creative work. According to him, "Creativity is an activity resulting in new products of a definite social value."

## **8.5 Difference between gifted and creative children**

The term gifted is usually used to refer to people with superior intellect or cognitive performance while creativity involves divergent thinking with respect to the traits of fluency, flexibility and originality of thought processes. The meaning and definition of gifted and creative children have already been discussed.

### **Check Your Progress –I**

1. Define gifted children.
2. Explain the meaning of creative children.

## **8.6 Characteristics of gifted children**

The gifted children have both positive and negative characteristics as given below

### **(a) Positive Characteristics of Gifted Children**

#### **(1) Intellectual Characteristics :**

1. The gifted children have, better ability to organize, analyse, memorise, synthesize and reason out things.
2. They have extensive rapidity in learning and comprehension.
3. Their self-expressions is quick and clear.
4. They are good in abstract thinking and have good insight.
5. They have good imagination and their ideas are original.
6. Their understanding and comprehensive power is good and they observe minute details.

7. Their vocabulary is rich.
8. They have good common sense and good general knowledge,
9. They are generally better in Science and Arithmetic,
10. They possess broad span of attention,
11. They have varied and wide interests, and
12. Their I.Q. is above 125 (according to Davidson and Goddard), 130+ (according to Hollingworth), and 140+ (according to Terman).

**(2) Personality Characteristics :**

The following are specific personality characteristics of gifted children :

1. Have better ability to adjust, organize, analyse and synthesise things
2. Possesses good physical health
3. Better planning capacity
4. Possesses high character
5. High achievers in class
6. May participate actively in discussion
7. More fond of questioning
8. May be popular
9. General superior personality
10. Sincere and dutiful
11. More humorous, cheerful and generous
12. Have friends of higher age and class

**(3) Social Characteristics :**

The following are the specific social characteristics of children :

1. They are socially well mature
2. They are popular in their group,
3. They are responsible in performing their duties or assigned work
4. They have quality of leadership.
5. They have the capacity to be socially useful and intermingle with others
6. They are humours and honest and trust worthy
7. They are democratic and less autocratic and
8. They possess high moral qualities.

**(b) Negative Characteristics of Gifted Children**

They possess some negative qualities which are as follows-

1. May be restless, inattentive and disturbing.
2. May feel isolated and neglected, if their potentialities are not paid due attention.
3. Becomes lazy if they find the school curriculum unchallenging to them, and does not take interest in school academic activities.
4. May become indifferent to class-work when not interested.
5. May become out spoken, and show sensitive temperament.
6. Shows egoistic and jealous behaviour,
7. Are generally careless and poor in spellings and handwriting, and
8. May not like the school curriculum which is for normal.
9. Sometimes show emotional- instability also
10. Do not recognise their potentialities.

**8.7 Identifying gifted children**

The identification of the gifted have been done from various angles:

1. Behavioural cues,
2. Teacher rating, and
3. Tests of IQ and Creativity.

**1. Behavioural cues**

There are 20 cues that indicate giftedness. The teacher plays a vital role in observing these in children.

- Level of learning of these children is equivalent to that expected of the older students.
- Reading starts at an earlier age.
- Awareness of uncommon things.
- High ability for symbolic thinking.
- Curiosity behaviour.
- Large vocabulary for the age level.
- Mature expressive ability.
- Ability to apply knowledge in unfamiliar situations.
- Good problem solving ability.
- Longer attention span.
- Dislike for a rigid time schedule.
- Annoyance with details.
- Intensive interest in one area.
- Diverse interests.
- High energy level.
- Self-critical and higher aspiration level.
- Thinking is faster.

- Poor study habit leading to careless work in certain cases.
- Requires fewer trials to learn.
- Extraordinary memory.

No child of course would reveal all these identifiable behaviour but are by large present in the gifted. Some can be observed more readily and in normal settings.

## **2. Teachers Rating**

Teacher's observation also plays a significant role. To aid the teachers to identify gifted children Renzulli and his associates (1971) suggested a scale consists of four areas of behaviour.

- a. Learning Characteristics which includes advanced vocabulary for age and grade level, independent reading habits, prefers advanced level books, quick mastery and recall of factual information and ability to make valid generalisations.
- b. Motivational Characteristics include self starting, persistence in task completion, striving for perfection and bored with routine tasks.
- c. Creativity Characteristics which includes greater curiosity about many things and greater originality in problem solving,
- d. Leadership Characteristics includes self confidence and success with peers, readiness for shouldering of responsibility, easy adaptations to new situation and change in time table.

The teachers can make use of this checklist and arrive at early identification of the gifted.

## **3. I Q Testing**

The type of identification procedures recommended by Marland is given below in order of preference :

1. Individual intelligence test

2. Previously demonstrated accomplishments
3. Teacher observation
4. Group achievement tests
5. Scores on creativity tests
6. Group intelligence tests.

Although giftedness can be aroused at any stage of development, yet it is during the school period that has meaning and significance for identification. Parents reports about the growth and developmental characteristics at different age levels also offer clue for identification. As a matter of fact, teacher's record of pupil behavior systematically using a checklist of behaviour expected provides comprehensive, objective and overall impression about the children and enable one to viable conclusions, regarding presence or absence of gifted characteristics.

### **8.8 Educational provisions for the gifted children**

Educational provisions consist of early admission of the gifted to provide experiences as early as possible. Other practices currently used in the schools are described below

#### **Non-graded Classroom**

Non-graded classroom is more appropriate for the gifted. The entire course of study in a level of education is divided into a series of stages. These are sequentially arranged. Each child in this system is free to complete the requirements of each stage and go on to the next at his own pace. This way the duration of the school year can be sufficiently reduced for the gifted in view of the fact he completes the course quite early.

#### **Special School/class for the Gifted**

Another alternative approach has been of opening special schools for the gifted or having a special class in the normal school, for teaching the gifted. For the purpose of instruction they sit in a separate room but for social and recreational activities they are kept with remaining students in the school. This permits both academic and social habits to grow.

## **Grade Skipping**

Grade skipping or double promotion is a technique to help the gifted to go to next higher class without proceeding through the normal school requirements on the belief that the gifted child will have no difficulty in the higher class by skipping the immediately preceding grade.

## **Early Admission**

Early admission of gifted children has been in practice in western society to the extent of 6 months to one year on the assumption that the children identified as having higher IQ can keep up with the curriculum demands of the class though their age is below the requirements of that level.

## **Advance Placement and Credit System**

Credit system at the secondary and college level takes care of the gifted. Under this system, a degree requires certain hours of course work prior to examination. The gifted child can manage more credit in the same time compared to average and slow learning children. As a result he completes a level earlier than other by satisfying all requirement except for the age required.

## **Acceleration and Enrichment Programme**

Acceleration strategies enable the gifted to select an educational programme that is challenging and interesting. In this case no special curriculum has to be developed. There are mainly three justifications in favour of acceleration. The child is challenged by a quickened tempo and advanced work. His abilities are challenged and opportunities are provided for the maximum development, of his capacity. The students, parents, and school save time and money. And in the last the gifted child embarks on his career and makes his contribution at an early stage.

In enrichment programme students are given additional materials to work within the regular classroom setting. Individual programming and independent studies, using a guest speaker to address the gifted, presenting materials in a challenging and motivating manner, pacing of information, highlighting the most important points, avoiding drill exercises are quite effective.

Authorities agree that whether a gifted child is taught in a regular class or a special class he needs a greatly enriched curriculum. The enrichment of curriculum must be both qualitative and quantitative. Qualitative enrichment of the curriculum means that gifted children should have greater opportunity than average children to go more deeply into the subtle and abstract aspects of the topic. They should be allowed to evaluate facts and argument critically to create new ideas and originate new line of thought. Quantitative enrichment means the breadth of work, an addition of units of work or topic, participation in activity such as production of a school magazine, plays, trips to museum, visit to public library, development of hobbies and interests other than the regular curriculum.

### **8.9 Let Us Sum Up**

1. Gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance. A creative person has a novel, exploratory and venturesome spirit.
2. The gifted children have both positive and negative characteristics as given below.
  - ✍ Positive characteristics of gifted children include better ability to organize, analyse, memorise, synthesize, imagine and comprehend things. Physically they are fit with high I.Q., are high achievers and have friends of higher age and class.
  - ✍ Negative characteristics of gifted children include feeling of being restless, inattentive and disturbing. They become lazy if they find the school curriculum unchallenging to them, and do not take interest in school academic activities. They show egoistic and jealous behaviour, are generally careless and poor in spellings and handwriting. Sometimes show emotional-instability also.
3. Gifted children can be identified on observing certain behavioral cues, asking teachers to rate such children and taking test of their I.Q and creativity.
4. Educational provisions for the gifted children includes provision of early admission of the gifted to provide experiences as early as possible, non-graded classroom,

special schools/ classes, grade skipping , advance placement and credit system, acceleration and enrichment programme.

### **8.10 Unit-end Exercises**

1. Define gifted children.
2. What do you mean by creative children ?
3. Differentiate between gifted and creative children.
4. Explain the positive and negative characteristics of gifted children.
5. How will you identify gifted children
6. Explain in details the various educational provisions that can be provided to gifted children.

### **8.11 suggested Readings**

1. Chauhan, S.S. (1980) “Advanced Educational Psychology” New Delhi : Vikas Publishing House Pvt. Ltd.
2. Kirk, A. Samuel , Gallagher, J. James and Anastasiow, J. Nicholas (1993) :Educating Exceptional Children,U.S.A.:Houghton Mifflin Company.
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**DELINQUENT CHILDREN**

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**Concept, causes responsible for delinquent acts among children, measures to prevent and treat delinquent children.**

**Structure**

- 9.1 Introduction
- 9.2 Objectives
- 9.3 Concept of delinquent children
  - 10.3.1 Meaning and definition of delinquency
  - 10.3.2 Characteristics of delinquents
  - 10.3.3 Types of delinquent acts
- 9.4 Causes responsible for delinquent acts among children
- 9.5 Measures to prevent delinquency
- 9.6 Measures to treat delinquent children
- 9.7 Let Us Sum Up
- 9.8 Unit-end Exercises
- 9.9 Suggested Readings

**9.1 Introduction**

Children nowadays, regardless of gender, social origin or country of residence, are subject to individual risks but are also being presented with new individual opportunities-

some beneficial and some potentially harmful. Quite often, advantage is being taken of illegal opportunities as children commit various offences, become addicted to drugs, and use violence against their peers. This problem known as juvenile delinquency is becoming more complicated and universal, and crime prevention programmes are either unequipped to deal with the present realities or do not exist. Many developing countries have done little or nothing to deal with these problems, and international programmes are obviously insufficient. Developed countries are engaged in activities aimed at juvenile crime prevention, but the overall effect of these programmes is rather weak because the mechanisms in place are often inadequate to address the existing situation. The teachers, parents and others, who are interested in social welfare and are responsible for shaping the personality of young generation, must understand the phenomenon of delinquency so that they may take appropriate measure to check it.

## **9.2 Objectives**

After going through this lesson you will be able to :

- Define delinquency ;
- Understand the causes responsible for delinquent acts among children ;
- Analyse the impact of delinquent acts on behaviour of children ;
- Cite measures to be taken to prevent delinquency among children ;
- Describe the measures to be taken to treat delinquent children.

### **9.3.1 Meaning and definition of delinquency**

Every society prescribes a set of norms which it expects that all its members should faithfully follow, but those who violate the social norms and behave in antisocial manner are called delinquents. The psychologist approaches delinquency from the point of view that it is deficiency in the formation of superego. The delinquent child fails to internalize the strict code of conduct set by the family and society. He fails to identify with the values of his parents. Johnson and Szurek defined delinquency as holes in superego when the id impulses are not controlled but admitted to overt action, psychotic or character disorders some of which are antisocial. Some psychologists define delinquency as

moral deficiency because of weak conscience due to improper teaching of the child in early years of life. According to Bandura and Walters delinquency is the manifestation of frustrated needs of the child which ultimately lead to aggression. Some psychologists hold the view that delinquency is underactivity of the central nervous system. The individuals have genetically-based inability to learn clear responses to secondary situations. These persons cannot associate punishment with the behaviour which brought it about.

According to biological view anti-social behaviour arises from organic or pathological causes located in the Nervous System. The delinquent fails to adjust to social environment. This approach emphasizes that antisocial behaviour is genetically based. Sociological approach lays more emphasis on social conditions which contribute to the occurrence of antisocial behaviour in young men and women.

Mental hygienists' view is that delinquency is the expression of an individual's needs. The individual by means of antisocial behaviour attempts to gratify his needs when he fails to gratify his needs by socially acceptable behaviour.

**Herbert Quay :**

The delinquent then would be a person whose misbehaviour is relatively serious legal offence, which is inappropriate to his level of development, is not committed as a result of extremely low intellect...and is alien to the culture in which he has been reared.

**Travis Hirschi :**

Delinquency is defined by acts, the detection of which is thought to result in punishment of the person committing them by agents of the larger society.

**Richard, A. Cloward :**

The delinquent act is behaviour that violates norms of the society, and when officially known, it evokes a judgment by agents of criminal justice that such norms have been violated.

**C. Burt :**

A child is to be regarded as technically delinquent when his antisocial tendencies appear so grave that he becomes or ought to become the subject of official action.

**Hadfield :**

Delinquency means anti-social behaviour.

**Valentine :**

Delinquency refers to the breaking of some law.

**Sen :**

Delinquency is any form of behaviour detrimental to the well-being of a society.

**Skinner :**

Juvenile delinquency is defined as the violation of a law that, if committed by an adult, would be a crime.

**9.3.2 Characteristics of Delinquents**

- (1) Physical They are mesomorphic in constitution, muscular and bold.
- (2) Temperament. Restlessly energetic, impulsive, extraverted, aggressive and destructive.
- (3) Attitude. Hostile, defiant, resentful, suspicious, unconventional and non-submissive to authority.
- (4) Psychological. Tending to be direct and concrete, rather than symbolic intellectual expression and less methodical in their approach to the problems.
- (5) Social cultural. Lack of affection, stability, moral standard of parents usually unfit to be effective guide for them.

**9.3.3 Types of Delinquent Acts**

The type of acts, which come under delinquent acts, are difficult to list down because of cultural variations and socio-economic conditions of the country. No universally acceptable list of delinquent acts can be drawn. Below we will mention some common types of acts which may be termed as delinquent.

- (1) **Acquisitive tendency.** The major percentage of delinquent acts of children have the immediate aim of satisfying acquisitive tendency. Stealing is the most common act which starts from family and if not detected and dealt adequately, is generalized to other situations in neighbourhood, schools and shops etc. Stealing releases tension particularly sexual tension in adolescents. They steal some object of sentimental value of their beloved as handkerchief, pen or ring etc. Sometimes stealing may be due to jealousy, hatred or aggression. Generally, in adolescence stealing is done by members of group who develop cohesion.
- (2) **Forgery. Another delinquent act is forgery.** Children commit forgery of several types. They may forge the signatures of their parents on cheques and can draw money from the bank.
- (3) **Aggressive tendencies.** Many juvenile offences are due to aggressive tendencies in children. The aggression gives relief to the offender. Aggression may be against inanimate or animate objects of the environment. The mode of attack may be physical aggression or by less direct method of mental cruelty.
  - a) Damaging school property
  - b) Bullying and mockery
  - c) Torturing of dumb animals
  - d) Committing suicide.
- (4) **The sex delinquency.** Sex delinquency is at its peak in adolescence period. Adolescents indulge in all types of sex delinquencies.
  - Homo-sexuality
  - Hetero-sexuality
  - Corrupting by talks
  - Obscene drawings and writings
  - Prostitution

- Abducting and raping
  - Exhibitionism
  - Making sexual suggestions
  - Masturbation.
- (5) **Tendency to escape.** This tendency indicates the inability of the individual to face reality. He runs from the situation-
- (i) Truancy from school,
  - (ii) Running from home.

### **Check Your Progress –I**

1. What do you mean by delinquency?
2. Enlist the various types of delinquent acts shown by delinquent children.

### **9.4 Causes responsible for delinquent acts among children**

The causes of and conditions for juvenile crime are usually found at each level of the social structure, including society as a whole, social institutions, social groups and organizations, and interpersonal relations. Juveniles' choice of delinquent careers and the consequent perpetuation of delinquency are fostered by a wide range of factors, the most important of which are described below.

#### **a) Economic and social Factors**

Juvenile delinquency is driven by the negative consequences of social and economic development, in particular economic crises, political instability, and the weakening of major institutions (including the State, systems of public education and public assistance, and the family). Socio-economic instability is often linked to persistent unemployment and low incomes among the young, which can increase the likelihood of their involvement in criminal activity.

**b) Cultural Factors**

Delinquent behaviour often occurs in social settings in which the norms for acceptable behaviour have broken down. Under such circumstances many of the common rules that deter people from committing socially unacceptable acts may lose their relevance for some members of society. They respond to the traumatizing and destructive changes in the social reality by engaging in rebellious, deviant or even criminal activities. An example of such a setting would be the modernization of traditional societies and the accompanying changes wrought by the application of new technologies; shifts of this magnitude affect the types and organization of labour activity, social characteristics, lifestyles and living arrangements, and these changes, in turn, affect authority structures, forms of obedience, and modes of political participation- even going so far as to influence perceptions of reality. In both developed and developing countries, consumer standards created by the media are considerably beyond the capacity of most families to achieve. Nevertheless, these ideals become a virtual reality for many young people, some of whom will go to great lengths to maintain a lifestyle they cannot afford. Because not all population groups have access to the necessary resources, including education, professional training, satisfactory employment and income, health services, and adequate housing, there are those who are unable to achieve their goals by legal means. The contradiction between idealized and socially approved goals and the sometimes limited real-life opportunities to achieve them legally creates a sense of frustration in many young people. A criminal career becomes one form of addressing this contradiction. One of the reasons for delinquent behaviour is therefore an excessive focus on proposed goals (achieving success) coupled with insufficient means to achieve them. The likelihood of deviant acts occurring in this context depends in many respects not only on the unavailability of legal opportunities but also on the level of access to illegal opportunities. Some juveniles, cognizant of the limitations imposed by legal behaviour, come under the influence of adult criminals. Many young people retreat into the confines of their own groups and resort to drug use for psychological or emotional escape. The use of alcohol and illegal drugs by juveniles is one cause of delinquency, as they are often compelled to commit crimes (usually theft) to obtain the cash needed to support their substance use.

**c) Urbanization**

Geographical analysis suggests that countries with more urbanized populations have higher registered crime rates than do those with strong rural lifestyles and communities. This may be attributable to the differences in social control and social cohesion. Rural groupings rely mainly on family and community control as a means of dealing with antisocial behaviour and exhibit markedly lower crime rates. Urban industrialized societies tend to resort to formal legal and judicial measures, an impersonal approach that appears to be linked to higher crime rates. Cultural and institutional differences are such that responses to the same offence may vary widely from one country to another. The ongoing process of urbanization in developing countries is contributing to juvenile involvement in criminal behaviour. The basic features of the urban environment foster the development of new forms of social behaviour deriving mainly from the weakening of primary social relations and control, increasing reliance on the media at the expense of informal communication, and the tendency towards anonymity. These patterns are generated by the higher population density, degree of heterogeneity, and numbers of people found in urban contexts.

**d) Migration**

Differences in norms and values and the varying degrees of acceptability of some acts in different ethnic subcultures result in cultural conflicts, which are one of the main sources of criminal behaviour. Native urban populations tend to perceive immigrants as obvious deviants

**e) The Media**

Television and movies have popularized the “cult of heroes”, which promotes justice through the physical elimination of enemies. Many researchers have concluded that young people who watch violence tend to behave more aggressively or violently, particularly when provoked. This is mainly characteristic of 8- to 12-year-old boys, who are more vulnerable to such influences. Media bring an individual to violence in three ways. First, movies that demonstrate violent acts excite spectators, and the aggressive energy can then be transferred to everyday life, pushing an individual to engage in physical activity on the streets. This type of influence is temporary, lasting from several hours to several days. Second, television can portray ordinary daily violence committed by parents or peers (the imposition of penalties for failing to study or for violations of certain rules or norms of conduct).

It is impossible to find television shows that do not portray such patterns of violence, because viewer approval of this type of programming has ensured its perpetuation. As a result, children are continually exposed to the use of violence in different situations—and the number of violent acts on television appears to be increasing. Third, violence depicted in the media is unreal and has a realistic quality; wounds bleed less, and the real pain and agony resulting from violent actions are very rarely shown, so the consequences of violent behaviour often seem negligible. Over time, television causes a shift in the system of human values and indirectly leads children to view violence as a desirable and even courageous way of reestablishing justice. The American Psychological Association has reviewed the evidence and has concluded that television violence accounts for about 10 per cent of aggressive behaviour among children.

**f) Exclusion**

The growing gap between rich and poor has led to the emergence of “unwanted others”. The exclusion of some people is gradually increasing with the accumulation of obstacles, ruptured social ties, unemployment and identity crises. Welfare systems that have provided relief but have not eliminated the humble socio-economic position of certain groups, together with the increased dependence of low-income families on social security services, have contributed to the development of a “new poor” class in many places. The symbolic exclusion from society of juveniles who have committed even minor offences has important implications for the development of delinquent careers. Studies show that the act of labelling may lead to the self-adoption of a delinquent image, which later results in delinquent activity.

**g) Peer influence**

Youth policies seldom reflect an understanding of the role of the peer group as an institution of socialization. Membership in a delinquent gang, like membership in any other natural grouping, can be part of the process of becoming an adult. Through such primary associations, an individual acquires a sense of safety and security, develops a knowledge of social interaction, and can demonstrate such qualities as loyalty or leadership. In “adult” society, factors such as social status, private welfare, race and ethnicity are of great value; however, all members of adolescent groups are essentially in an equal position and have similar opportunities for advancement in the hierarchical structure. In these groups well-

being depends wholly on personal qualities such as strength, will and discipline. Quite often delinquent groups can counterbalance or compensate for the imperfections of family and school. A number of studies have shown that juvenile gang members consider their group a family. For adolescents constantly facing violence, belonging to a gang can provide protection within the neighbourhood. In some areas those who are not involved in gangs continually face the threat of assault, oppression, harassment or extortion on the street or at school.

#### **h) Delinquent Identities**

Delinquent identity is always constructed as an alternative to the conventional identity of the larger society. Violence and conflict are necessary elements in the construction of group and delinquent identities. The foundations of group identity and activity are established and strengthened through the maintenance of conflict relations with other juvenile groups and society as a whole. Violence serves the function of integrating members into a group, reinforcing their sense of identity, and thereby hastening the process of group adaptation to the local environment. Other factors that may provide motivation for joining a gang are the possibilities of economic and social advancement. In many sociocultural contexts the delinquent way of life has been romanticized to a certain degree, and joining a gang is one of the few channels of social mobility available for disadvantaged youth. According to one opinion, urban youth gangs have a stabilizing effect on communities characterized by a lack of economic and social opportunities.

#### **(i) Hereditary Causes**

Juke Family Study by Dugdale has proved that heredity plays some part in bringing about delinquency. Following hereditary factors are responsible for the delinquency in the children :

1. **Defective families :** The children of families with suffering from backwardness and epilepsy etc. are prone to develop into delinquent children.
2. **Physical defects :** Certain physical defects are inherited and physical defects are sometimes responsible for delinquency. When physical defect of a child is laughed at, there is every possibility that he may wish to destroy the society and adopt anti-social behaviour as he considers that society is responsible for his disability.

3. **Mental defects :** Parents who have low I.Q. generally have off-spring of lower I.Q. Lower I.Q. generally encourages anti-social behaviour. Burt found that 80% of delinquency is due to low I.Q.
4. **Temperamental or emotional defects :** Parents who are emotionally unstable generally give birth to emotionally unstable children. This innate emotional instability is responsible for many delinquent acts.

**(j) Home environment**

Home environment influences child very much. Some of the causes pertaining to home which lead to delinquency are :

- Poverty and unemployment of parents may force a child to resort to stealing and other immoral jobs.
- Presence of step-father or step-mother may lead to neglect of child causing emotional strain and the child may run away from home.
- Discriminatory treatment to two children in the same home can give rise to jealousy and delinquency.
- If there is very loose or very strict discipline in the home child may become delinquent. If discipline is too loose, the child may be entirely free to himself and may act according to his own wish. If the discipline is too strict, the child sometimes revolts against it and he may indulge in many anti-social activities.
- Children whose brothers and sisters are delinquents are likely to grow into delinquents.
- If parents are drunkards or gamblers, or they indulge in adultery their children may also become delinquents.
- Children of broken homes where husband and wife have separated or divorced, or some one has died or the parents are constantly away from their children then the children may become delinquents.
- Other home factors which are responsible for delinquency are : Over-crowding

families, lack of accommodation, improper place of living, mental abnormalities of parents, mother or father being in service and high ambitions of the parents which they want to realise through the achievements of their children.

**(k) Employment of children**

Employment of children in factories and industries at a very tender age is also an important contributing factor of delinquency. The condition of children working in industries and mills is pitiable. They have to work like machines in the factories. Their tender feelings receive a rude shock. So after factory hours they go to undesirable places for entertainment.

**(l) Uncongenial school atmosphere**

Uncongenial school atmosphere can also cause delinquency among children. Some of the factors are-

- ✍ Unsympathetic and harsh attitude of the teacher or strict discipline in the school
- ✍ Wrong methods of teaching
- ✍ Lot of home work
- ✍ Frustrated and maladjusted teachers
- ✍ Overcrowding in the class
- ✍ Difficult courses
- ✍ Lack of co-curricular activities.

**Check Your Progress –II**

1. How can family environment cause delinquency among children?
2. Media has encouraged delinquency among children- comment.
3. Explain the role of peer groups on delinquent behavior of children.

## 9.5 Measures to prevent delinquency

### (A) Measures to be Adopted by Parents

1. **Sympathetic and affectionate attitude :** Parents should give full affection to children so that the sense of security may be inculcated in them. Moreover, parents should be sympathetic and they should provide solution of their problems. The children should not be made to realise that they are ignored and rejected children.
2. **Congenial atmosphere in the home :** Home life should be made congenial i.e., parents should live amicably. There should be no separation, divorce, quarreling or maltreatment of any one of the partner.
3. **Knowledge of psychology and child guidance :** Parents should know the elements of psychology to give proper attention to their children. Moreover they should get some training in child guidance so that they may be able to guide their children properly and help them in making adjustments.
4. **Provide models :** Parents should provide models for their children and they should give examples of security and stability because children follow their parents consciously or unconsciously .
5. **No over-protection or under-protection :** Parents should not give over-protection or under-protection to their children. If the child gets over-protection then he does not try to think for himself. Thus he can very easily be led away by the temptations offered by his bad companions. If he gets under-protection he may become maladjusted and delinquent child.
6. **No liberal pocket money :** Parents should not give a large amount of pocket money to their children otherwise there is possibility that they may develop bad habits like smoking, gambling, drinking and frequently going to pictures. It should be kept in mind that giving of no pocket money is also not desirable.
7. **Knowledge of methods of family planning :** Parents should have the knowledge of methods of family planning. The parents will not be in a position to pay full attention to all the children if their number is quite large. Moreover, they cannot satisfy the various needs of their children if the income of the parents is limited.

Therefore, the parents should have a check on the growth of their families.

8. **Watch on children's friends :** Parents should invite the friends of their children to their homes and should try to obtain information about their habits, likings, dislikings and other social, moral and emotional traits.
9. **Understanding their children and taking other preventive measures :** The parents should understand their children-their mental traits, urges and emotions and should take preventive measures if the child's behaviour tends to be abnormal.
10. **Education of the children:** Parents should take care of the education of their children. They should know the kind of progress which their children are making at the schools.

**(B) Measures to be adopted by schools :**

The school has an important role to play to modify the delinquent behaviour and to find the solution where there is problem of delinquency . However the school must seek the co-operation of parents, society and even medical experts to deal with the problem depending upon the intensity of the problem and situation involved in it. School can do a lot by providing the following facilities :

1. **Co-curricular activities :** The school should provide co-curricular activities because they help in sublimation of various instincts and emotions and the surplus energy of children is also utilised in them.
2. **Efficient, trained and experienced teachers :** There should be efficient, trained and experienced teachers in the schools. They should be friends, philosophers and guides. They should be in a position to solve the problems of their students psychologically.
3. **Child-centred education :** Education should be given according to the needs, capacities, capabilities, aptitudes and interests of the students.
4. **Congenial environment :** School environment should be free from emotional tensions.

5. **Psychological behaviour :** Teacher should be kind, impartial, honest, disciplined, efficient and capable of handling the children psychologically and tactfully.
6. **Good methods of teaching :** Teacher must adopt good and efficient methods of teaching. He should motivate the students properly and he should also make use of various audio-visual aids in order to make their lessons interesting.
7. **Study habits :** Good study habits should be developed among the students.
8. **Democratic discipline :** There should be democratic discipline in the school.
9. **Proper guidance :** Arrangement should be made for the guidance of students. Each school should appoint a trained psychologist and a counsellor who can solve the problems of the students psychologically.
10. Co-ordination between school and home should be maintained. Both teachers and parents should try for the prevention of delinquent behaviour.
11. Size of class : Size of class in the school should be reduced so that teacher may give individual attention to children.
12. Medical check up: School should have a clinic and the delinquents should be medically checked and their physical defects should be treated.

**(C) Measures to adopted by the state and social agencies**

1. **Good schools :** The state and social agencies should establish good schools where the children can attain proper education.
2. **Free education :** There should be free education for poor students and the state should be responsible for fulfilment of their basic needs.
3. **Eliminating evil influences :** The state should own the responsibility for eliminating evil influences in the society like gambling, drinking, robbery, begging, pick-pocketing, prostitution, sex-appealing advertisements, production of sexual pictures, unemployment and poverty.
4. **Homely environment to illegitimate children :** The state should provide homely

environment to illegitimate children. They should not feel that they are unwanted in the world.

5. **Opening reformatory agencies :** The state should open and strengthen reformatory agencies like Juvenile courts, Anathalayas, Police service, Guidance Clinics, Mental Hospitals and beautify children's gardens.
6. **Welfare councils :** The state should organise welfare councils in every town and strengthen religious institutions, youth serving agencies like Bharat Scouts and Guides, N.C.C., A.C.C., educative agencies like libraries, recreative agencies like recreative clubs and organize public tournaments .
7. **Sterilizing couples :** The state should sterilize such couples who are suffering from some mental disorders because the offsprings of such parents will be of lower mental level who in their childhood can easily be led away towards delinquent behaviour.

#### **9.6 Measures to treat delinquent children**

The treatment of delinquent children is done by applying psychological technique known as psychotherapy. The psychotherapist on the basis of his observation and magnitude of the problems of a delinquent child may use any of the following methods :

- (1) Re-education,
- (2) Abreaction,
- (3) Persuasion,
- (4) Suggestion and counselling,
- (5) Environmental treatment and
- (6) Modern technique of behaviour modification.

##### **(1) Re-education**

The child has already learned anti social behaviour. The aim of re-education is not meant to give him academic information but it simply means to build his self by giving

information on sex problems and family relations. The aim of re-education is to clarify his ideas on different problems which he faces.

**(2) Abreaction**

Abreaction means providing opportunity to the child to express his pent-up and suppressed emotional feelings by means of free-expression through discussion. The therapist becomes the parent figure in whom the child confides. He may use free association, psycho-drama or play techniques.

**(3) Persuasion**

The therapist may persuade the delinquent not to indulge in delinquency in future. It is based on an appeal to the reason of the delinquent child. Persuasion should be logical and thorough which may appeal to the delinquent child. It has been reported by therapists that persuasion is not of great value because it only removes the symptoms and not the underlying cause.

**(4) Suggestion and counselling**

Positive suggestions and counselling are given to strengthen the superego of the delinquents.

**(5) Environmental treatment**

Environmental treatment is, generally, done by improving the home and school environment of the child. Parents are advised to change their attitude and better treatment is given to the child. Some psychotherapists propose that delinquent child may be shifted to another better environment for temporary period preferably in lodging or foster home. It is expected that by placing the delinquent child in new environment he may give up his delinquent acts and may start his life afresh.

**(6) Modern techniques of behaviour modification**

Almost all psychologists agree that delinquents are not born but they are the product of environmental influences. Antisocial behaviour is acquired or learned so this type of behaviour can be modified. An individual can learn constructive, socially acceptable behaviour by being placed in an environment where the behaviour consequences are

programmed according to the principles of Programmed Learning recently developed by Prof. B.F. Skinner of Harvard University. Burchard 1967 launched a programme for mildly retarded delinquents. Delinquents were kept in residential schools and their behaviour was punished or reinforced systematically. On a response contingent basis, this programme was developed to teach the delinquents the practical skills essential for adjustment in the community and for eliminating antisocial behaviour.

### **9.7 Let Us Sum Up**

1. Every society prescribes a set of norms which it expects that all its members should faithfully follow, but those who violate the social norms and behave in antisocial manner are called delinquents.
2. Delinquents are mesomorphic in constitution, muscular, bold, restlessly energetic, impulsive, extraverted, aggressive, destructive, hostile, defiant, resentful, suspicious, unconventional and non-submissive to authority. They tend to be direct and concrete and lack affection and stability.
3. Delinquent Acts include acquisitive tendency, Forgery, aggressive tendencies like Damaging school property, bullying and mockery, torturing of dumb animals and committing suicide. There is also tendency to escape from home and school.
4. Causes responsible for delinquent acts among children are economic and social Factors, Cultural Factors, Urbanization, Migration of people from one place to another, the influence of media, the growing gap between rich and the poor, peer influence, certain hereditary Causes, uncongenial home and school environment.
5. By efforts of family, school, society, social workers and the state delinquency among children can be prevented.
6. By re-education, abreaction, persuasion, proper counselling, environmental treatment and using modern technique of behaviour modification delinquency can be treated.

## **9.8 Unit-end Exercises**

1. Explain the meaning of delinquency.
2. Discuss the characteristics of delinquent children
3. What are the delinquent acts shown by delinquent children?
4. Describe the causes responsible for delinquent acts among children.
5. How can we prevent delinquent behaviour among children?
6. Highlight the measures that can be taken to treat delinquent children.

## **9.9 Suggested Readings**

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**MOTIVATION AND ADJUSTMENT**

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**Concept and Types of Motivation (Intrinsic and Extrinsic Bases of Motivation - Needs (Physiological and Psychological) and Drivers**

**Structure**

**10.1 Objectives**

**10.2 Introduction**

**10.3 Concept of Motivation and Motives**

**10.4 Types of Motivation**

**10.5 Bases of Motivation Needs**

**10.6 Physiological and Psychological Needs**

**10.7 Drives**

**10.8 Suggested Readings**

**10.1 Objectives :** To enable students to :

- Understand the concept of motivation.
- have an understanding about motives
- know the different types of motivation
- Understand the bases of motivation
- have an awareness of various Physiological and Psychological needs.

## **10.2 Introduction :**

Motivation in one form or the other is always present in the root of all human activities. It is an art of incentives and appeals which includes principles and techniques for attaining an objective and also of making efforts in that direction. In every aspect of human activity, pertaining to society, group, family, race or nation and wherever the person has an interest or an aim to achieve a particular thing, some motivation is at work. In the absence of motivation, we shall not take up a work or shall leave it incomplete even when undertake, however, noble, well-meaning and beneficial that might be. It is sometimes noticed that a will for undertaking some work is created not only on account of any particular situation or an immediate necessity but also by motivation. Under motivation we are compelled to undertake a work and stick to it in the teeth of severe opposition. Utilization of motivation in any sphere amounts to adoption of those means that make the task smooth and easy.

## **10.3 Concept of Motivation and Motives :**

We see a girl getting bruises and cuts and quite often falling down while learning cycling but she tries to improve her performance by practice. Similarly, a student may be seen to burn the midnight oil as the examination approaches. What makes the girl and the student behave in a particular manner? The answer to such questions as the why and how of behaviour lies in the key word 'motivation'. They behave as they do so because they are motivated to do so. Motivation, thus, may be regarded as something which prompts, compels and energizes an individual to act or behave in a particular manner at a particular time for attaining some specific goal or purpose.

**Definitions of Motivation :** Some definitions of motivation are as under :

**Crow and Crow,** "Motivation is considered with the arousal of the interest in learning and to the extent in basic in Learning."

**Good,** "Motivation is the process of arousing, sustaining and regulating activity."

**Mc Donald,** "Motivation is an energy change within the person characterised by effective arousal and anticipatory goal oriented activities."

In the light of above definitions it can be concluded that motivation in its psychological sense is concerned with the inculcation and stimulation of the learner's interest in the learning activities. It makes a student interested in his studies and a farmer in his farming. It is the force which energizes a man to act and to make constant efforts in order to satisfy his basic motives.

**Motives :** Motives are the dynamic force that energizes all behaviour. What we do and the manner in which we do is governed by the motives behind it. Our all acts are the results of our attempts to satisfy our motives. In general, the motives are classified into two broad groups as primary and secondary motives. Primary motives are the biological or physiological motives. These motives ensure the preservation of life for the individual. Examples of such motives are hunger, thirst, sex, elimination of body wastes, sleep, rest etc. These are Universal motives and are found in all organisms. They are inborn and innate.

Secondary motives are the psychological or social motives. They are acquired like other forms of learned behaviour in the course of satisfaction of the biological needs. Examples of such motives are the need for belongingness and affiliation, need for security, desire of gaining status and recognition, power motive and achievement motive.

#### **10.4 Types of Motivation :**

Motivation can be broadly classified into two types :

##### **1. Natural motivation or Intrinsic motivation and Artificial Motivation or Extrinsic Motivation**

Natural Motivation is directly linked with the natural instincts, urges and impulses of the organism. The individual who is intrinsically or naturally motivated, performs an act because he finds interest within the activity. He is engaged in learning something because he derives pleasure within the learning of that thing. The activity carries its own reward and the individual takes genuine interest in performing the activity due to some outside motives and goals. When a student likes to solve a mathematical problem and derives pleasure in the task of solving it or tries to read poetry and the reading itself gives him pleasure, we can say that he is intrinsically motivated.

## **2. Artificial or Extrinsic motivation :**

In such motivation the source of pleasure does not lie within the task such kind of motivation has no functional relationship to the task. Here the individual does or learns something not for its own sake but as a means of obtaining desired goals or getting some external reward. Working for a better grade or honour, learning a skill to earn the livelihood, receiving praise and blame, rewards and punishment etc. all belong to this category.

In comparison to extrinsic motivation, intrinsic motivation, as a source of spontaneous inspiration and stimulation, brings better results in the teaching learning process. Therefore, it is always better to make use of intrinsic motivation, whenever it is possible to do so. Depending upon the situation and nature of the task the choice for providing appropriate motivation should be made so that profound interest in the activity is generated.

### **10.5 Bases of Motivation - Needs**

Needs are general wants or desires. Every human being has to strive for the satisfaction of his basic needs. We may describe motivation as a state of the organism which involves the existence of a need that moves or drives the organism from within and directs its activities to a goal that can bring about the satisfaction of the need. Therefore, motivation as a general term constitutes a cycle completed in different stages. In the beginning there is a need, desire or want which gives birth to drive or motive the drive or motive so produced, then motivates the organism to act. In this way, the behaviour of the organism becomes goal directed. By operating the environment, the individual reaches the desired goal and his drive or motive is satisfied.

### **10.6 Physiological and Psychological Needs**

Nothing can be said about the number of individual needs. While some experts in the field hold that the number of individual needs is infinite, others have provided a definite number. However, human needs can be broadly divided into two broad categories, namely physiological needs and psychological needs.

**Physiological needs :** All our organic or bodily needs fall into this category.

They may be further categorised as :

1. In the first Category of physiological needs, we have the need for oxygen, water and food. These needs are most fundamental for our survival and existence. One cannot even imagine survival beyond a limited period if we are deprived of these.
2. In the chain of our survival and existence, the other category of physiological needs includes needs such as the need for rest when tired, action when rested, regular elimination of waste products from the body, having normal internal body temperature, sleep after periods of wakefulness, protection from the threats of physical environment like hazards of weather, natural calamities, wild animals etc.
3. In the third category of physiological needs, we can place the need for the satisfaction of sex urge. Although the sex urge is not essential for the survival of the individual, it is the strongest human urge in the satisfaction of which lies his proper growth, development, adjustment and well-being. Moreover, the satisfaction of this need and normal sexual behaviour is most essential for a happy life.
4. In the last category of physiological needs are the needs associated with the demands of our senses. These sensory needs include the need for physical contact, sensory stimulation and stimulus variability and manipulation. These needs are also considered to be essential for our general welfare and optimal growth.

**Psychological Needs :** Under Psychological needs we can include all those needs that are associated with the socio-cultural environment of the individual. Although, such needs are not linked with the survival of the organism, yet deprivation of these may lead to a psychological state, thereby seriously affecting its survival and welfare. These needs may be classified as :

1. **The need for freedom or gaining independence :** Nature has created us free and independent individuals. Every individual possesses a craving for independence. Therefore, all human beings have an urge to remain free and independent.
2. **The need to achieve :** Every person manifests the need for achievement not only to stand well in the eyes of others but also for the satisfaction he will get out of his

own accomplishment. The particular mode of achievement sought by an individual somewhat depends upon his talents and the environment in which he lives. Some people seek achievement in athletic activities, others in intellectual or academic field while someone else seeks achievement in spiritual world. In this way, whatever may be the form of achievement, the need for achievement is clearly shown by all human beings.

3. **The need for affection :** It is essentially a desire to love and be loved that leads in maintaining pleasant and happy relations with others. Every body irrespective of his age needs love and affection. He possesses a sort of emotional craving for the satisfaction of this need.
4. **The Need for Recognition :** Every individual has an inherent desire to gain recognition, appreciation and esteem in the eyes of others. Each one of us in our respective group wants to gain appreciation and recognition of our fellowmen and possesses a strong desire to excel them in order to gain social status, prestige or approval.
5. **The Need for Companionship :** Man is referred to as a social animal in the sense that he has an inherent desire to be with one's own kind and maintain relationships with them. The real strength of this need can be known by the fact that one of the most severe punishments possible to all normal individuals is solitary confinement or social rejection.
6. **The Need self-Assertion :** This is a very powerful need that exhibits itself in a desire to dominate others. It may vary in intensity from person to person but it is exhibited by all of us in one or the other situation irrespective of age, strength and status. This need to assert oneself gives birth an important motive which works as a strong determinant of one's personality and behaviour.
7. **The Need for self-Actualization :** Every one of us has inherent craving for the expression of one's self and actualization of one's own potentialities. This

need makes an individual to think that there is something for which he is best fitted and is not happy until he gets opportunities to do what he is best fitted for. In this way we want to get adequate opportunities for the expression and development of our potentialities and so we strive hard and are not happy until we get the opportunities for self-expression and self-actualization.

All the above mentioned needs whether physiological or psychological are vital and indispensable. In the proper satisfaction of these needs lies the proper growth, development and happiness of the human beings. In case they are met efficiently, the result is a balanced and integrated personality. When needs are not met or when their satisfaction is in danger or delayed, the person may become frustrated, inhibited and unbalanced.

#### **10.7 Drives :**

A need gives rise to a drive which may be defined as an aroused awareness, tendency or a state of heightened tension that sets off reactions in an individual and sustains them for increasing his general activity level. The existence of a need moves or drives the individual from within and directs his activities to a goal that may bring about the satisfaction of that need. The strength of a drive depends upon the strength of the stimuli generated by the related need. Drives of any nature are divided into two categories. In the first category are the biological or primary drives such as hunger, thirst, escape from pain etc. In the second category are the Bio-psychological or secondary drives such as fear or anxiety, desire for approval, struggle for achievement, aggression and dependence. These drives are not related to physiological needs and therefore, do not arise from imbalances in the body's internal functioning. They arise from Bio-psychology needs and are said to be acquired through social learning as a result of one's interaction with the socio-cultural environment. Contrary to the secondary drives, primary or biological drives are basically unlearned in nature and rise from biological needs.

## **10.8 Suggested Readings**

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**MEANING AND CHARACTERISTICS OF MOTIVATION  
AND LEARNING**

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**11.0 STRUCTURE**

- 11.1 Objectives
- 11.2 Meaning of Motivation and Learning
- 11.3 Definitions
- 11.4 Characteristics of Motivation and Learning
- 11.5 Let Us Sum Up
- 11.6 Check Your Progress
- 11.7 Suggested Further Readings

**11.1 OBJECTIVES**

After going through this topic, you are expected to :

- Explain the meaning of motivation and learning.
- Give some definitions of motivation and learning.
- Explain the characteristics of motivation and learning.

**11.2 MEANING OF MOTIVATION AND LEARNING**

Motivation is derived from the word ‘movere’ which means ‘to move’. It is process of arousing action, sustaining activity in progress, regulating and directing pattern

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*Ms. Puneet Kour, Assistant Prof. in Education, DDE, University of Jammu*

of activity through energy transformation within the tissues of the organism. It is an art of inculcating and stimulating interest in studies and in other such activities. Some of the aspects of motivation are stressed by the terms.

Incentive, intention, impulse, desire, need, urge, wish, want, will, attitude, readiness, purpose and the like.

Motivation in one form or the other is always present in the root of all human activities, as human behaviour in one form or the other is guided by motives or drives. In every sphere of life and at various phases of activities motivation plays a vital role. So our success and achievement in life depends on motivation. Motivation is said to be the ‘heart of learning’, ‘golden road to learning’ and ‘potent factor in learning’, as all learning is motivated learning. Adequate motivation results in promoting reflection, attention, interest and effort in the pupils and hence promotes learning. Learning cannot be successful, effective or efficient without persistent, purposeful and selective effort.

### 11.3 DEFINITIONS

Some of the well known definitions of motivation are given below :

**Definition by Atkinson** : “The term motivation refers to the arousal of a tendency to act, to produce one or more effect.”

**Definition by Guilford** : “Motivation is an internal factor or condition that tends to initiate and sustain activity”.

**Definition by Good** : “Motivation is the process of arousing, sustaining and regulating activity.”

**Definition by Skinner** : “Motivation in school learning involves arousing, persisting, sustaining and directing desirable behaviour.”

**Definition by Gates** : “Motives and conditions – psychological and physiological – within the organism that dispose it to act in a certain way.”

### 11.4 CHARACTERISTICS OF MOTIVATION

By analyzing the definitions of motivation, we can infer the following characteristics of motivation.

1. **Psychological process** : Motivation is a psychological or internal process.
2. **Need** : The internal process is initiated by some need or motive.
3. **Activity** : This internal process is directed towards some activity.
4. **Satisfaction** : This activity satisfies the need or want.
5. **Eagerness** : Eagerness is found when a person is motivated. Eagerness means readiness for the task.
6. **Concentration** : Attention is concentrated in motivation.
7. **Persistence** : Persistence in work is shown in motivation.
8. **Achievement** : Motivation helps in the achievement of the goal.
9. **Differ from learner to learner** : Motives differ from learner to learner because every learner has his own set of needs at a particular point of time.
10. **Continuous process** : Motivation is a continuous process because human needs are unlimited and fulfillment of one set of needs gives rise to another set of needs.
11. **Goal directed behaviour** : Motives cause goal directed behaviour.
12. **Energy mobilization** : Motivation brings energy mobilization.
13. **Differ from time to time** : Motives energizing us differ from time to time. Motives come and go. A motive may not have the same energy potential at all points of time.

### 11.5 LET US SUM-UP

So, we can conclude that motivation is a life long process. Individual needs motivation whenever he wants to do any task in his life. It is seen that the individual does not give more interest in same task for long time. He may feel boredom. It is only motivation which creates interest within him. It is internal process but mostly stimulated by some external forces.

## **11.6 CHECK YOUR PROGRESS**

1. Discuss the meaning of motivation along with some definitions.
2. Explain the characteristics of motivation.

## **11.7 SUGGESTED FURTHER READINGS**

1. Chaube and Chaube, Educational Psychology, L.N. Aggarwal, Agra, Reprint 2002.
2. Damral, B.D. (2003) : Foundations of Education Psychology.
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**ADJUSTMENT**

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**Concept Mechanisms of Adjustment - Rationalisation and Sublimation**

**Structure**

**12.1 Objectives**

**12.2 Introduction**

**12.3 Concept of Adjustment**

**12.4 Aspects of Adjustment**

**12.5 Characteristics of a well adjusted person**

**12.6 Mechanisms of Adjustment - Rationalisation and Sublimation**

**12.7 Suggested Readings**

**12.1 Objectives :** After going through this Unit the learner should be able to :

- Understand the concept of Adjustment
- have an understanding about various aspects of adjustment.
- highlight the characteristics of a well adjusted person.
- Understand Mechanisms of adjustment.

**12.2 Introduction**

There has been a continuous struggle between the needs of the individual and the external forces since time immemorial. According to Darwin's theory of evolution; those species which adapted successfully to the demands of living, survived and multiplied while

others who did not, died out. Therefore, the adaptation or changing of oneself or one's surroundings according to the demands of the external environment became the basic need of our survival. It is as true today with all of us as it was with the Darwin's primitive species. Those of us who can adapt or adjust to the needs of changing conditions can live happily and successfully while others either vanish, lead miserable lives or prove a nuisance to the society.

A person does not always get success according to his desires and efforts. The reason for this lies either in the individual. However, a person makes efforts to adjust himself somehow in his environment. In these efforts sometimes he achieves full success and sometimes only partial. On achieving partial success, a person tries to find other means for adjustment.

### **12.3 Concept of Adjustment :**

The dictionary meaning of adjustment is to fit, make suitable, adapt, arrange, modify, harmonise or make correspondent. Thus, when we make an adjustment between two things, we adapt or modify one or both of them to correspond to each other. Adjustment is that process through which a person tries to strike a balance between his requirements and situations. Adjustment is the establishment of a satisfactory relationship representing harmony, conformance, adaptation or the like. However, the concept of adjustment is not so simple as adaptation. Psychologists and scholars differ considerably in interpreting its meaning and nature as can be seen from the following definitions :

L. S. Shaffer, "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."

Crow and Crow, "An individual's adjustment is adequate, wholesome or health to the extent that he has established harmonious relationship between himself and the conditions, situations and persons who comprise his physical and social environment."

Gates and Jersild, "Adjustment is a continual process by which a person varies his behaviour to produce a more harmonious relationship between himself and his environment."

Carter V. Good, “Adjustment is the process of finding and adapting modes of behaviour suitable to the environment or the changes in the environment.”

The above discussion can lead us to summarise in the following way :

- a) Adjustment is the interaction between a person and his environment. How one adjusts in a particular situation depends upon one’s personal characteristics as also the circumstances of the situation.
- b) Adjustment helps us in keeping balance between our need and the capacity to meet these needs.
- c) Adjustment persuades us to change our way of life according to the demands of the situation.
- d) Adjustment gives us strength and ability to bring desirable changes in the conditions of our environment.
- e) Adjustment is a process that takes us to lead a happy and well contented life.

The process of adjustment is continuous. It starts at one’s birth and goes on till one’s death. A person as well as his environment are constantly changing as also are his needs in accordance with the demands of changing external environment. Consequently, the process of individual adjustment can be expected to change from situation to situation.

#### **12.4 Aspects of Adjustment**

Adjustment, although seeming to be a universal characteristic or quality has different aspects and dimensions. The main aspects of adjustment are :

- a) **Health adjustment :** One is said to be adjusted with regard to one’s health and physical development. If a child’s physical development and abilities are in conformity with those of his age mates and he does not feel any difficulty in his progress due to some defects or incapacities in his physical organs he enjoys full opportunity of being adjusted.
- b) **Emotional Adjustment :** Emotions play a leading role in one’s adjustment to self and his environment. An individual is said to be emotionally adjusted if he is able

to express his emotions in a proper way at a proper time. It requires one's balanced emotional development and proper training in the outlet of emotions.

- c) **Social Adjustment :** How far one is adjusted can be ascertained by one's social development and adaptability to social environment. Social development requires the development of social qualities and virtues in an individual. One should be social enough to live in harmony with his social beings and fulfill responsibility and obligations towards his fellow-beings, society and the country.
- d) **Home Adjustment :** Home is the source of greatest satisfaction and security to its members. The relationship among the family members and their ways of behaviour play leading role in the adjustment of a child. All problematic and delinquent behaviour to a great extent is the product of faulty upbringing and uncongenial atmosphere at home.
- e) **School or Occupational Adjustment :** In the adjustment of adults, their occupation plays a great role. The school environment casts its influence over the adjustment of the children and adolescents. How far a child is satisfied with his school environment, is completely in the pattern of his total adjustment.

Similarly, the occupational world of adults dominates their mode of adjustment. Degree of satisfaction with the choice of occupation, working conditions, relationship with colleagues, financial satisfaction and chances for promotion decides one's adjustment to his occupation and contributes significantly towards his overall adjustment.

### **12.5 Characteristics of a well adjusted person**

A well adjusted person is supposed to possess the following characteristics

- a) **Flexibility in behaviour :** A well adjusted person is not rigid in his attitude or way of life. He can easily accommodate or adapt himself to changed circumstances by changing his behaviour.
- b) **An adequate level of aspiration :** His level of aspiration is adequate. It is neither too low nor too high in terms of his own strengths and abilities. He is capable of controlling his mind.

- c) **Capable of struggling with adverse circumstances :** He is not easily overwhelmed by the odd circumstances. He has sufficient will and Courage to resist and fight with odds. He has an inherent drive to master his environment rather than passively accept it.
- d) **A realistic perception of the world :** He holds a realistic vision and does not fly un-necessarily in the world of ideas and imagination. He always plans, thinks and acts pragmatically.
- e) **Does not possess critical or fault finding attitude :** He appreciates the goodness in objects, persons or activities. He does not try to look for weaknesses in adults. His observation is scientific rather than critical.
- f) **Awareness of strengths and limitations :** A well adjusted person knows his strengths and weaknesses. He fully knows the areas in which he excels and also accepts his limitations in the others.
- g) **Satisfaction of his needs :** His basic needs like organic, emotional and social are fully satisfied or in the process of being satisfied. He does not suffer from emotional crises and social isolation. He feels reasonably secured and maintains his self esteem.

Besides above mentioned qualities, a well adjusted person has an adequate philosophy of life, respects himself and others and always feels satisfied with his surroundings.

## 12.6 Mechanisms of Adjustment

In our life we have so many ambitions and aspirations but it is not possible to achieve all that we desire. There are many situations when we fail in our attempts and get frustrated. Our failures and frustrations may bring injury to our ego and thus give birth to feelings of inferiority and anxiety. Most of us do not like to face reality by accepting our shortcomings and failures but tend to resort to certain mechanisms by defending our inadequacies or anxieties. These mechanisms or devices are called as adjustment or defence mechanisms. Thus the individual takes recourse to various methods in his adjustment. Some of the common adjustment mechanisms are discussed below :

### **Rationalisation :**

Sometimes a person tries to find an excuse for his shortcomings, failures and incompetence and tries to justify them in his heart. In this way he tries to rationalise his shortcomings, failures and incompetence. Thus, rationalisation is a defence mechanism in which a person justifies his otherwise unjustified behaviour by giving socially acceptable reasons for it and attempts to defend himself by inventing plausible excuses to explain his conduct. If a person has failed to achieve his goal then he may say that he deliberately gave up the effort because he did not find it worthwhile.

Besides he may also derive satisfaction by saying that a particular job was too small or too big for him. A person suffering from this kind of behaviour fails to understand reasons behind them. The habit of finding an excuse prevails both in children and adults. Sometimes a child blames his blowing water for his late coming. Similarly, adults find an excuse for not doing a work by saying that they were busy with some other important work.

### **Sublimation**

Sublimation is the process by which unconscious and unsocial desires are channels into socially acceptable activity. It is a device by which an individual's antisocial impulses are made socially acceptable. An individual has to become a victim to many entangling situations. However, he achieves some success even in the face of adverse situations. This becomes possible through the sublimation of instances. Sublimation inspires a maintained towards good action. An individual may make his personality dominant and remove many of his shortcomings through sublimation. For example an individual by sublimating thoughts relating to inferiority complex may lean towards some specific success in some sphere of life. Through sublimation an individual may overcome many of his difficulties and adjust himself in the environment. Among all the adjustment mechanisms, sublimation is the most advanced highly developed constructive mechanism. Through the use of this operation the energy of intolerable impulses and drives is successfully directed to consciously acceptable channels.

## **12.7 Suggested Readings**

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**PERSONALITY : CONCEPT, DEVELOPMENT OF PERSONALITY  
TYPES OF PERSONALITY**

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**Structure**

- 13.1 Objectives**
- 13.2 Introduction and Meaning of word personality**
- 13.3 Concept of personality**
- 13.4 Development of Personality**
- 13.5 Types of Personality**
- 13.6 Check your progress**
- 13.7 Suggested Readings**

**13.1 Objectives**

**To enable students :-**

- 1. To know the word personality**
- 2. To know the nature of personality**
- 3. To know the process of personality development**
- 4. To know the different types of personality**

### **13.2 Introduction**

The term personality is the most complex and complicated, and it is very difficult to give a true and universal acceptable explanation of it, because it covers the whole nature of the individual.

The origin of the term personality lies in the latin word '*Persona*' which means a mask that was used by actors on their faces while acting on the stage. From this explanation, it appears that the personality is outward appearance of a Person, this is a very limited view of Personality, whereas this idea has undergone massive changes and the concept of personality goes further deeper than mere outward appearance and now the term personality is defined as the integration of manifold traits both internal and external.

### **13.3 Concept of Personality**

Different Psychologists have given different view points about the term personality. They have defined it on the basis of their studies, keeping in view the different aspects of it.

According to Watson (1930), the father of the behaviourist defined the term Personality on the basis of his behavioural studies, "Personality is the sum of activities that can be discovered by actual observation over a long period of time to give reliable information.

In the view point of 'Eysenck', (1971) "Personality is the more or less stable and in during organization of a persons character, temperament, intellect and Physique, which determine his unique adjustment' to the environment."

In the view point of G.W. Allport (1948) "Personality is the dynamic organization within the Individual of those psycho-physical, system which determine his unique adjustment to his environment."

According to Fredenbengh, "Personality is a system of complex characteristics by which the life pattern of the individual may be identified".

By concluding all the view points of the different Psychologists we can say that personality is the physical mental, social and emotional pattern of the Individual, with the help of which he acts. It is always dynamic and changing in nature rather it is the total

quality of an individual which includes everything about a person.

### **13.4 Development of Personality**

#### **Introduction**

Personality of the Individual is unique and distinguishable from others. Personality is not static it always developing and enlarging and flexible enough to admit changes from time to time. In other words Personality development is a continuous process as new habits, new ways of adjustment are always part of one's life as well as part of personality.

The process of personality development starts from the birth of a child and continue till the end of his life. During this period of life number of ups and downs comes across with the individual which leaves some important impression on him which way later on become the personality features of his life. However, it has been established that personality of the each individual is the product of heredity of environment thus both the factors contribute significantly towards the personality development of the child.

#### **Heredity Factor**

Heredity factors of personality are those which the individual gets at birth time from his ancestors. Heredity is the genetic force with the help of which some traits of the previous generation are transmitted to the present one. It is permanent in nature and greatly influences to the development of personality. Heredity also determine ones physical structure, organic and emotional activities and indicates the level of intelligence. This is also a source from where one can inherits mode of behaviour, power and nature. Thus for the development of the individual, heredity plays a definite role while environment an indefinite.

#### **Environmental Factors**

After the birth, the child comes in contact with different types of environment, which enriches his experience and a result his attitude, outlook character, wisdom, intelligence go on changing qualitatively and quantitatively.

There are number of environmental influences that help to shape personality of the child. Amongst them some important are discussed as under :

## **Family**

Family is the most important agency or factor that effectively shapes the personality of the child in the early stages of childhood. The experiences of the child in the family are important for his personality development. Everything he experience in the association of his family members leaves an permanent mark on his personality.

Moreover family is the first institution where the child starts formulating his own definition for his liking, disliking, safety security, position, recognition etc. The role of the father and mother in the family is very important in shaping the personality of their children. Friendly and tolerant fathers help children to have greater emotional stability and self confidence. On the other hand, dominant and rigid fathers will only help the development of frightened and dependent children. Similarly, mothers in the family also influence children accordingly to their degrees of dominance, over – protectiveness, rigidity etc.

Atmosphere of the family, in general is also important for shaping the personality in the children. A peaceful, loving and democratic atmosphere results in children being orderly affectionate and peace loving. On the other hand family where there is tension and conflict among parents, the child is likely to develop feelings of insecurity and inferiority which way make the child emotionally disturbed.

## **School**

School is also an important factor of building the personality of the child because the child spends the most important period of his life between 6 to 20 years of age in the environment of the school or institution. It is the place from where the child starts his formal learning and learning of new experiences, which may influence to a great extent in the personality development.

Atmosphere of the school in general and the role of teacher in specific are the important factors for fascinating proper personality development of the child. The overall behaviour and the attitude of the teacher in the process of teaching, examination, evaluation etc. also put a strong impact on the personality development of the child in both ways desirable or undesirable. In brief we can say that the school and the schooling of the child are very important factors which contribute a lot in the process of personality development of the child.

## **Social Factors**

There is a strong affect of the social factors on the personality development of individual. Social factor such as: parents, friends class-mates, teachers, media, organizations and agencies etc. contribute too much in the process of personality development of the child. With the help of all these sources, social interactions take place in the life of an individual which ultimately influences the child. After the birth of child, the child is dependent upon others for the fulfillment of all his needs and necessities. It is the society which helps him for the satisfaction of the his needs and necessities. Besides this, social factors are also helpful in developing social efficiency among the children, which is helpful for social unity and integrity. Moreover, it also broaden the social circles of friendship and relations which further imparts the lessons of living, working and thinking together. Therefore, social factors are very important for the process of socialization, which is the important indicator of ones personality.

## **Cultural Factors**

Culture is a social heredity, which is transmitted from generation to generation. It refers to total life activities of a society, what the people think, do and feel constitute culture. Every society has its own culture and similarly is of the individual and every individual is to a great extent influenced by his own culture directly or indirectly.

In the view point of E.B. Tyler, “Culture is a complex totalisation of knowledge, faith, morality, laws customs traditions and other so many things that an individual receives as a member of the society”. From this view point it is clear that culture includes everything which is the requirement of a man. All the cultural indicators are important for one’s personality.

Moreover, culture affects our behaviour and attitude right from our birth. It influences each and every part and stage of human life. It tries to develop the human personality in a right way.

## **Peer-Group**

The Peer-Group has a significant impact on the personality of the Individual. Peers are the individuals with whom an individual identifies. Individuals under the Peer-Group

usually are of the same age, having similar type of habits, needs desires etc. They are the source of affection, sympathy and understanding which generally facilitate in the development of *Identity* which is the important indicator of one's personality.

### **Self Concept**

By self concept we mean the totality of the thoughts, feelings with reference to himself or herself. It is the means by which we create our image and identity. Self concept is not inborn or inherited, but it is network of ideas about himself and is developed by the individual through interaction with the environment and reflecting on the experience of that interaction.

There are various components of self concept such as : physical, academic, social etc. but they all influence our personality on one way or the other. For example, if the people hold high positive attitude towards us this enhances our self image and acceptance and if the people hold negative attitudes towards us, it creates feelings of worthlessness which may lead us to self defence or withdrawal from the social situation.

## **13.5 Types of Personality**

### **Introduction**

In order to know the true nature of Personality there are different theories which have been given by different psychologists. With the help of the theories and studies, conducted by them, they were in a position to describe, the basic structure and underlying entities involved in personality along with the processes by which these entities interact. With the help of the result outcome of these theories, Personality of the people in general can be classified. The main theories are : - type theory, trait theory and psycho- analytical theory.

### **Type Theory**

On the basis of this theory human personality can be classified into clearly defined types and each person depending upon his behavioural characteristics, somatic structure, blood types fluid in the body.

On the basis of type theory, Kretschmer, a German Psychologist has divided the

people into 4 categories:- With regard to the personality.

1. **Pyknic** : This group includes the persons who are short, fat and round. Their belly is comparatively bigger and round. They show abnormal swings in mood, but generally popular and amiable persons.
2. **Asthenic** : These people are thin and simply built. They are taller in comparison to their weight. Their hands and legs are longer, muscles and bones not strongly built, breast undeveloped and short, and the belly low. They show the symptoms of lack of nutrition, slimness but a tall physique. These people are generally over sentimental.
3. **Athletic** : These people are neither much fat nor too thin. Their bone structure is strong and muscles looks stronger and well shaped. Their height is normal and they are handsome and healthy to look at. They have a balanced body and personality.
4. **Dysplastic** : People belonging to this category show the characteristics, these are the combination of above three groups.

Though they are not strong, they can not be called weak. Generally they like mental labour more than physical labour.

On the basis of the same theory, 'Spranger, again the German Psychologist divided the people 6 types of Personality : -

1. **Theorist** : The people, who are less realistic and more idealist, never like to indulge themselves in any political or social activities. They are always busy in pondering over truths, ideas and theories about various things. Their thinking process is impersonal and objective.
2. **Economic** : People who always think about their financial welfare and about raising their saving are grouped under category. They consider everything from the financial point of view and evaluate every action on the basis of profit in terms of money.
3. **Aesthetic** : They are romantic, beauty loving and fans of art, culture, literature,

sculpture etc.

4. **Social :** These people are always sympathetic towards others and express love, affection for them. They also constantly engage themselves in the service to the society.
5. **Political :** These people are power hungry and always try their best to dominate others.
6. **Religious :** They most of the times, think about the God, religion, society etc. and show such behaviours in daily work of theirs.

### **Karl Jung has classified personality into three types**

1. **Extrovert.** An extrovert is very social and develops social values in a proper way. He never indulges in such activities which may make others angry. A extrovert is social and shares the Social responsibilities in co-operation with other members of the society.
2. **Introvert.** An introvert prefers to live and remain in isolation. Introverts are not social but are moody and possess obstinate temperamental patterns.
3. **Ambivert.** Ambiverts possess behaviour patterns of both extroverts and introverts. Sometimes they behave like extroverts and at other times they express the attitude of introverts.

**Trait theory :** - According to this theory the personality is viewed in terms of various traits; like Shy, honesty, lazy, dull, aggressive, resourceful, serious, emotionally stable etc. Traits may be defined as relatively permanent consistent general behaviour patterns that an individual shows on different situation. These patterns are said to be the basic units of one's personality.

On the basis of the traits, "Allport" classified the people into three category of personality.

1. **Cardinal Traits.** Cardinal traits of those which a person express in common in

relation to his behaviour. These are life time traits and appear frequently. These traits a person takes with a birth and dies with them. Human intelligence and his will to achieve the goal in life are such type of traits.

2. **Central Traits.** Central traits of those traits which are seen in the individuals for a particular type. Traits like self-expression and sociability are some of the examples of the central traits.
3. **Emotional Traits.** Such traits are otherwise called nature, tendency or temperament of an individual. It is felt for too little a time, but its impact is very strong and forceful.

On the same pattern the famous Psychologist R.B. Cattell (1973) also classified the people into two categories of personality.

1. **Surface Traits.** Surface traits are recognized and expressed in outer behaviours of an individual. Each of these states traits included many qualities of a man and they work towards achieving the same goal. For example, a student showing proficiency in both mathematics and literature has a surface trait, because two different factors influence him to achieve success in these two subjects.
2. **Source Traits.** Qualities which fuel the human behaviour and act as the source of surface traits are called Source Traits. Every human being shows many types of behaviours. In spite of difference in behaviours there is a common instinct which is responsible for arousing such behaviours. In other words it is like a thread that sews so many different looking behaviours. That thread or the common factor indicates a dimension of human personality. And this dimension of personality is a source trait.

### **Psycho-Analytical Theory**

According to the theory, the Psychologists are of the opinion that the answers to most of the important questions about human behaviour lie somewhere behind the surface, hidden in the unconscious part of the mind. They further believe that the behaviour of an individual is influenced by the powerful forces within the personality, in which the individual is not aware. Therefore, the main focus of the theory is to understand human personality

by analyzing conscious and unconscious level of human mind.

### **Freud's psychoanalytic theory**

According to this theory personality of an individual is built on the premise that the mind is topographical and dynamic. There are divisions which are always moving the interrelated. The human mind has three main divisions such as conscious, semi-conscious and unconscious. These levels of the human mind are continuously in a state of clash and compromise to the birth of one or the other type of behavioural characteristics resulting in a specific type of personality. Further this theory believes that personality is built around the three unfired and interrelating systems namely ; id, ego, and superego.

1. **Id.** It is the inherent and the basic source of energy present at the time of birth. It is the supply line of the energy to the man which further inspire him to work. It consist of set ambitions, desires, tendencies etc. as are guided the pleasure seeking principle. It has no values, knows no laws, follows no rule, does not recognize right or wrong and considers only the satisfaction of the need.
2. **Ego.** The ego functions as a police man to check the unlawful activities of id. It is the executive unit with the power of veto. It follows the principals of reality and acts with intelligence to control, select and decide the different activities of individual. The function of the ego further is to maintain a balance between the work done by the Id to obtain pleasure and on the other hand fear of punishment of it. In brief but controls the Id is called ego.
3. **Superego.** This is the third system of the human personality. It is the ethical and moral arm of the personality. It is a decision making quality of an individual which decides what is good or bad to the social norms and therefore acceptable or unacceptable. It affects the personality in a more positive and noble way.

Therefore Id, Ego and Superego are interrelated. Though they functions different from each other, but can not work without the help of each other.

### **13.6 Check your progress**

1. What do you mean by the term personality? Discuss in details

2. Discuss the important factors responsible for personality development.
3. What are the various types of personality ? Discuss in details

### **13.7 Suggested Readings**

1. Chouhan, S.S. (1978): “Advanced Educational Psychology”. New Delhi, Vikas.
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**ASSESSMENT OF PERSONALITY**

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- 1. Subject Techniques (Anecdotes, Autobiography, Case study)**
- 2. Objective Techniques (Controlled Observation, Structural Interview and Rating scales)**

**Structure**

- 14.1 Objectives**
- 14.2 Introduction about the assessment of personality**
- 14.3 Assessment of personality**
- 14.4 Detail of Subjective Techniques**
- 14.5 Detail of Objective Techniques**
- 14.6 Check your progress**
- 14.7 Suggested Readings**

**14.1 Objectives**

To enable students

- 1. To know about personality assessment.**
- 2. To know various techniques of personality assessment**

3. To know subjective techniques of personality assessment
4. To know objective techniques of personality assessment

## **14.2 Introduction**

Assessment of personality in a scientific manner is quite a difficult task, because the term personality is a complex characteristic. It is dynamic in nature and it affects the behaviour of the child at all this times, But an attempt was made by the psychologists for the assessment of the personality, with the help of the following techniques : Subjective, Objective and Projective.

## **14.3 Assessment of Personality**

Assessment of personality with the help of subjective techniques

## **14.4 Subjective Techniques:**

In subjective techniques, the assessment of personality is made on the basis of the subject matter. In the process individual is required to speak or write about himself. In addition to it, the informations can be gathered from the friends, teachers and relations. The important techniques under subjective techniques of personality assessment are discussed as under :

### **Autobiography :**

Autobiography is a an important technique of personality assessment. It is also known on self history, meaning thereby, history of the self. Under this technique the researcher design some headings about the life of an individual and the individual (under assessment) is asked to write about the relevant information asked therein. With the help of gathered informations the researcher arrives at certain conclusions regarding the personality of the subject or individual.

This technique, alone cannot evaluate the personality fully, because the individual sometimes fails to write the detail of all the happenings and experiences on account of his loss of memory and also much of the unconscious desires, wishes etc. In addition to this, the attitudes and inclinations of the subject cannot come on the surface.

## **Case study**

Under this method Personality assessment of the individual is made on the basis of hereditary and environmental factors affecting the life. The background and the mental level of individual is studied and other related information about him are also taken into consideration, such as : the family history customs, norms, traditions, order of birth etc. In addition to this complete school history, or record of the individual is also taken into consideration such as, behaviour, academic achievement role, participation in different activities etc. In addition to the above, health record of the child is also studied for the purpose personality assessment.

**Anecdotal Records :** This record is one of the important source of informations about the person under personality assessment. This record is the description of actual examples of behaviour of a student as observed by teachers and the counsillar. Moreover, there is a description of child's conduct and personality in terms of frequent, brief, concrete observations made and recorded by the teacher. In brief Anecdotal Records are very helpful in providing specific and exact description of one's personality. Moreover, it is very useful in understanding the behaviour of the child in diverse situations.

### **14.5 Objective Techniques**

Under objective method, different techniques can be used for the purpose of personality assessment. The techniques used in this method are dependent on the external behaviour of the individual. Moreover the behaviour of an individual is observed in actual life situation with the help of observation and situation tests.

#### **Controlled observation**

Observation under controlled conditions is a very popular method of personality assessment. In this method the observer observes the behavioural pattern of an individual (under assesment) in an actual life situations. In the process of observation, the observer decides the personality traits he needs to know or study and then observes the most relevant activities of the individual in real life situation. After gathering all the informations about the individual, an analysis is made by the observes about the personality of the individual.

## **Structural Interview**

Interview is a face to face verbal interchange in which one person the interviewer attempts to elicit information on expression of opinion or beliefs from another person (Maccoby, 1954)

In simple words, interview is a technique of getting information directly from the subject about his personality, in a face to face contacts. For this purpose the Researcher tries to arrange a meeting with the person whose personality is to be assessed.

There are two type of face to face interaction in the interview : structured and unstructured. In structured interview the expert adapts a systematic and pre-determined approach for the assessment of the personality. The expert usually prepare a list of question for the purpose and tries to seek answers from the subject.

In unstructured interview there is nothing planned. The expert is not restricted to a pre-planned list of questions to be asked to the subject, who is under personality assessment.

Hence interview is the most important and relatively flexible tool to elicit personal information about the persons for several purposes ; like job, admission, research, personality assessment etc. but its worth depends on the experience and skill of the experts.

## **Rating Scale**

Rating scale is one of the important technique designed to estimate the personality traits in quantitatively terms. This device is specifically used to assess the individual in terms of others opinion of some of his personality traits. In simple words, it reflects the impression of the subject upon the person who rates him.

There are four types of Rating Scales, which are in use : Numerical Scales, Descriptive Scale, paired comparison and graphic rating scales.

- 1. Numerical Scales:** In these scales numbers are assigned to each personality trait.

2. **Descriptive Scales :** In these scales, the trait under study is described in word or phrase.
3. **Paired Comparison :** In these scales the person is required to place the ratee being rated in a rank order, from high to low on the attitude or opinion in question.
4. **Graphic Scales :** In these scales the rater put a checks along a line which is supposed to represent degrees in the trait from one extreme to another. Sometimes, the line is divided into units and the rating may be assisted by descriptive phrases placed along the line.

The preparation and operation of all these scales can become more useful if the following principles are followed.

1. The trait must be clearly defined
2. The degrees of the traits must be defined clearly
3. The rater should be instructed not to record any thing on the scale.
4. Ratings of a particular person should be obtained from more than one judge.

Thought Rating scales have been proved very effective on personality assessment but these tools are having different type of problems like : subjectively, limited social contacts between the rater and the ratee, low reliability unable to study traits such as inferiority, self sufficiency etc.

#### **14.6 Check your progress**

1. **What do you mean by the term personality? Discuss in details.**
2. **Discuss in details the concept of assessment of personality.**
3. **What are the main methods of personality assessment?**
4. **Discuss subjective methods of personality assessment.**
5. **Discuss the objective methods of personality assessment.**

#### **14.7 Suggested Readings**

- 1. Chouhan, S.S. (1978) : “Advanced Educational Psychology”. New Delhi, Vikas.**
- 2. ‘Damral and Dash – ‘Psychological Foundations of Education’.**
- 3. Batnagar, Suresh and Anamika Saxena ‘Advanced Educational Psychology’ (2000-2001).**
- 4. ‘Mathur S.S.’ (Prof. Kumann University) ‘Psychological Foundations of Education’ Rev. Ed. 1996.**
- 5. Mangal S.K. “Advanced Educational Psychology. Second Edition, Prentice Hall of India New Delhi 2005.**

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**ASSESSMENT OF PERSONALITY**

**PROJECTIVE TECHNIQUES (THEMATIC APPERCEPTION TEST,  
RORSEHACH INKBLOT TEST)**

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**Structure**

**15.1 Objectives**

**15.2 Introduction**

**15.3 Assessment of personality with projective techniques**

**15.4 Description of TAT**

**15.5 Description of Rorsehach Inkblot Test**

**15.6 Check your progress**

**15.7 Suggested Readings**

**15.1 Objectives**

**To enable students :-**

- 1. To know about personality assessment**
- 2. To know about projective techniques of personality assessment**
- 3. To know detail of T.A.T**
- 4. To know about detail of Rorschach Ink-blot test**

## **15.2 Introduction**

Projective methods of personality assessment are those which evoke responses from the unconscious mind and provide an opportunity to go into the depth of unconscious built of an individual's personality. The word projection here is used to encourage the subject to use his imagination freely. In these methods, the subject is made to project himself into the test situation and thus reveal his attitudes, motives, aspirations etc. which ultimately helps the researcher to predict the personality. There are different techniques which are used under projective method like sentence completion test, perception of Ink blots, TAT, CAT and so forth.

## **15.3 Assessment of personality with projective techniques**

There are number of projective techniques with the help of which personality assessment is made :

## **15.4 Thematic Apperception Test**

This test is also commonly known as (T.A.T) and was devised by Morgan and Murray in 1935, during the course of a research programme at Harvard University. The test consists of perception of certain pictures in a thematic manner revealing imagination themes. The test material consists of 31 cards. 30 cards are with various kinds of scenes and one blank card. All the cards are depicting various situations in which the individual moves. Further classification of the 30 cards are, 10 cards are meant for male, 10 for female, and 10 are common for both. The test is usually administered in two sessions using 10 pictures in each session.

For the purpose of personality assessment all the pictures are presented to the subject and he is asked to make up a story of each of the pictures within a fixed period of time. In the story making process certainly the subject unconsciously projects and expresses several informations about his own desires, liking dis-liking etc. in a natural way. With the help of the stories made by the subject, it becomes easy for the researcher to establish one's personality.

### 15.5 The Rorschach Ink-blot test

This test of personality assessment has been developed by Hermann Rorschach in 1929. The test is consisted of 10 Cards of different types of ink-blot. Out of 10 cards, 5 cards are black and white in color and other 5 are multicolored. All the ink-blot are completely unstructured and the shapes of the blot do not have any specific meaning.

During the process of test, the subject is shown the 10 ink-blot one at a time in a systematic manner and then he is asked to give responses of the subject concerning these ink-blot on separate papers.

After the collection of the responses, the scoring is done, while keeping in view the following :- location, contents, originality and determinants :

**Location :** It refers to the part of the blot with which the subject associates each response.

**Contents :** Objects seen by the subject in the cards : animal, human beings natural objects etc.

**Originality :** It refers to the type of responses original and popular.

**Determinants :** It refers to the characteristics of the blot e.g., movement and color etc.

After the scoring part is over the Researcher generally make the prediction about the personality of the subject (under study).

It is therefore, only through various kinds of relationships, observations, records and integration of results from various parts that a final global picture about a subject's personality can be drawn. The test demands a lot of training and skill in scoring and interpretation on the part of examiner and therefore, the work must be taken and done seriously.

In brief, Rorschach Ink-blot test has been proved very effective and the field of psychology, for understanding the personality features of an individuals in and integrated manner.

## **15.6 Check your progress**

- 1. Discuss the nature and meaning of projective techniques of personality assessment.**
- 2. Discuss the Thematic Apperception Test (T.A.T) of personality assessment**
- 3. Discuss the Rorshach Inkblot Test of personality assessment**

## **15.7 Suggested Reading**

- 1. Chouhan, S.S. (1978) : “Advanced Educational Psychology”. New Delhi, Vikas.**
- 2. ‘Damral and Dash – ‘Psychological Foundations of Education’.**
- 3. Batnagar, Suresh and Anamika Saxena ‘Advanced Educational Psychology’ (2000-2001).**
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**STATISTICS AND ITS USE IN EDUCATION, MASURS OF VARIABILITY**

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**16.1 Objectives**

To enable students

1. to understand nature of statistics
2. to understand the meaning of statistics
3. to understand why to study statistics
4. to know the meaning of variability
5. to understand the meaning of range, mean deviatio and quartile deviation and the technique to find these measures of variability
6. to describe the merits and limitations of different measures of variability

**16.2 Introduction**

Statistics have become a common part of everyday life and therefore deserve our attention. A quick glance at the newspaper tells that statistics deals with crime rates, birth rates, average income, average snow-fall and so on. By a common definition, therefore, statistics consists of facts and figures.

The word ‘Statistics’ is derived from a Latin term ‘Status’ which meant state. In old times, numerical records were maintained regarding the divisions of the state, their respective population, birth rate, income etc. The word ‘Statistics’ was used for the first time by a German mathematician Gottfried Achenwall in 1749.

### 16.3 Maning of the Term Statistics

The term 'Statistics' refers to numerical description of quantitative aspects of things. These descriptions may take the form of counts or measurements.

Statistics then is a science that deals with the collection, organization, presentation, analysis and interpretation of numerical data. "Collection of data" is the process of procuring measurements of counts. Valid conclusions can be drawn only from adequately collected data. "Organization of data" is the task of presenting the collected measurements or counts in a form suitable for obtaining logical conclusions. "Presentation of data" is their placement in the form of tables, diagrams or various types of graphs in some suitable form. "Analysis of data" means computation of their means and the degrees of variation in and among them etc. In the process of analysis, data are categorized into useful and relevant divisions.

The final step in an investigation consists of interpreting the data which have been obtained. "Interpretation" is the discovery of the cause-effect relation between various types of data and the inferences put forth by the analysis which the data put on the surface. Interpretation promotes generalization and formulation of a theory and also provides answer to the question being looked into. Thus when statisticians use the word statistics, they are referring to a set of methods and procedures that help present, characterize and interpret observations.

### 16.4 Definition of the Term Statistics

**Bowley** defines 'Statistics' as 'numerical statements of facts in any department of inquiry placed in relation to each other'. It means that if numerical facts do not pertain to a department of inquiry or if such facts are not related to each other they cannot be called statistics.

In the words of **Horace- Secrist**, Statistics are "aggregates of facts, affected to a marked extent by multiplicity of causes, numerically expressed, enumerated or estimated according to a reasonable standard of accuracy, collected in a systematic manner of a predetermined purpose and placed in relation to each other."

Thus, statistics is a science dealing with the collection of quantitative data. **Webster** has defined statistics as a quantity that describes a sample and is thus an estimate of a parameter of the population.

In short, statistics can be defined as the science of organizing, describing and analyzing data.

## **16.5 Use of Statistics in Education**

### **Statistics and Economics**

In the year 1890 Prof. Alfred Marshall, the renowned economist, observed that “Statistics are the straw out of which I, like very other economist, have to make bricks.” This proves the significance of statistics in economics. Economics is concerned with the production and distribution of wealth as well as with the complex institutional set-up connected with the consumption, saving and investment of income. Statistical data and statistical methods are of immense help in the proper understanding of economic problems and in the formulation of economic policies. In fact, these are the tools and appliance of an economist’s laboratory. For example, what to produce, how to produce and for whom to produce these are the questions that need a lot of statistical data in the absence of which it is not possible to arrive at correct decisions.

### **Statistics and Physical Sciences**

The physical sciences, especially astronomy, geology and physics, were among the fields in which statistical methods were first developed and applied, but until recently these sciences have not shared the 21<sup>st</sup> century developments of statistics to the same extent as the biological and social sciences. Currently, however the physical sciences seem to be making increasing use of statistics, specially in astronomy, chemistry, engineering, geology, metrology and certain branches of physics.

### **Statistics and Natural Sciences**

Statistical techniques have proved to be extremely useful in the study of all natural sciences like astronomy, biology, medicines, meteorology, zoology, botany, etc. For example,

in diagnosing the correct disease the doctor has to rely heavily on factual data like temperature of the body, pulse rate, blood pressure. Similarly, in judging the efficacy of a particular drug for curing a certain disease experiments have to be conducted and the success or failure would depend upon the number of people who are cured after using the drug. In botany the study of plant life one has to rely heavily on statistics in conducting experiments about the plants, effect of temperature, type of soil, etc. In fact it is difficult to find any scientific activity where statistical data and statistical methods are not used.

### **Statistics and Research**

Statistics is indispensable in research work. Most of the advancement in knowledge has taken place because of experiments conducted with the help of statistical methods. For example, experiments about crop yields and different types of fertilizers and different types of soils or the growth of animals under different diets and environments are frequently designed and analyzed with the help of statistical methods. Statistical methods also affect research in medicine and public health. In fact, there is hardly any research work today that one can find complete without statistical data and statistical methods. Also, it is impossible to understand the meaning and implications of most of research findings in various disciplines of knowledge without having at least a speaking acquaintance with the subject of statistics.

### **Statistics and Computer**

Computer is a very reliable machine. But just as a car, no matter how reliable, cannot be expected to behave sensibly when in the hands of an incompetent driver, so the usefulness of the results from a computer depend critically upon the competence of the programmer. The computer has also made possible the use of statistical methods that were virtually impossible in the days of hand computation simply because of the sheer quantity of calculation involved.

Thus Statistics is used in practically every field of knowledge such as education, psychology, biology, sociology, economics, geography, anthropology etc. Statistics includes collection of facts relating to any field of inquiry in a systematic manner and their analysis and interpretation. A great many problems of psychology and education involve measuring

instruments, such as tests and inventories and correlational and experimental procedures. The evidence collected by testing, and experimentation is stated as numerical facts. Statistical methods are essential to analysis and interpretation of such facts. Reliable evidence usually can be quantified and numerical facts are the results of quantification. If we have to deal with many of our biological and educational problems on reliable grounds, it is necessary to employ statistics. Such an enormous amount of scientific observations is unmanageable in the crucial form. To interpret the data many months of work will have to be done. Statistical methods serve scientific investigation by organizing and interpreting the data.

## 16.6 Variability

The term Variability has much the same meaning in Statistics as it has in everyday language, to say that things are variable means that they are not all the same. In Statistics our goal is to measure the amount of variability for a particular set of scores, a distribution. In simple terms if the scores in a distribution are all the same then there is no variability. If there are small differences between the scores, then the variability is large. **“Variability** provides a quantitative measure of the degree to which scores in distribution are spread out or clustered together.

The three variables of central tendency i.e. mean, median and mode do not themselves give an adequate description of the distribution of our data. We need to know how the observations with the same mean or median differ considerably in the variability of their measurements about the average.

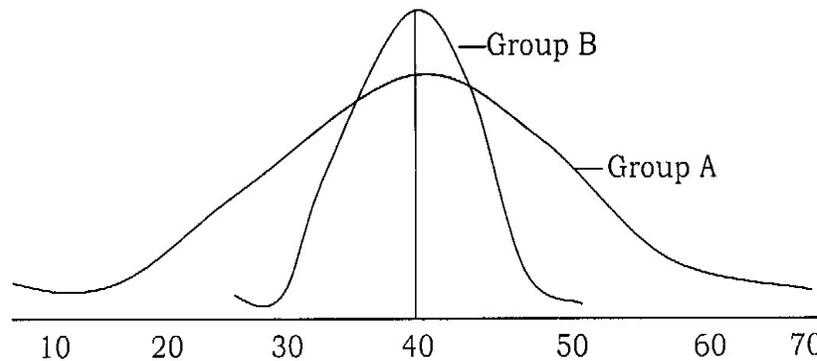
Let us consider the following measurements of performance in English for two samples of students taken from two classes A and B in a college.

Sample A	31	32	30	33	34
Sample B	34	32	28	29	27

Both the samples have the same mean i.e. 32. It is quite obvious that the performance of students of class A is more uniform than that of students of class B. Thus, we say that the variability or the dispersion of the observations from the average is less for sample A than

for sample B. The sample A shows more homogeneity than sample B. If a group is homogenous, that is, made up of individuals of nearly same ability, most of its scores will fall around the same point on the scale the range will be relatively short and the variability small, respectively.

If the group contains individuals of widely differing capacities scores will be strung out from high to low, the range will be relatively wide and the variability large.



**Figure 1**

Graphically, in Figure 1 there are two frequency distributions of the same area (N) and same mean 40 but of very different variability. Group A ranges from 10 to 70 and Group B from 30 to 50. Group A is three times as variable as Group B and is spread over three times the distance on the scale of scores though both the distributions have the same central tendency.

Thus we observe that measures of central tendency alone are not enough, we should also know how the individual scores are clustered around or scattered away from the central value. This property of distribution is called **variability**, dispersion or the spread.

### **16.7 Measures of Variability**

The most important measures of variability or dispersion are :

### **16.7.1. the range;**

- 2. the mean division ;**
- 3. the quartile deviation and**
- 4. the standard deviation**
- 1. The Range :**

The simplest of all the measures of variability is the range. The range of a set of numbers is the difference between the largest and the smallest numbers in the set.

Thus, the range is defined as the difference between the highest and lowest values.

Symbolically,

$$R (\text{Range}) = L - S$$

Where L = the largest number in the set

S = the smallest number in the set.

#### **Example 1.**

The range of the set of observations

10, 12, 12, 18, 19, 22, 24 is :

$$24 - 10 = 14$$

Thus, for the above mentioned data, the range could be the difference between 24 and 10, i.e. 14.

The only advantage of range is that it can be easily calculated and readily understood. But the range is a poor measure of variability, particularly if the size of the sample or population is large. It considers only the extreme values and tells us nothing about the distribution of values in between.

**Example 2 :**

Consider the following two sets of data, both with the range of 12 :

3, 4, 5, 6, 8, 9, 10, 12, 15

3, 8, 8, 9, 9, 9, 10, 10, 15

In the first set the mean and the median are both 8, but the numbers vary over the entire interval from 3 to 15. In the second set the mean and the median are both 9, but most of the values are close to the average. Although the range fails to measure this variability between the upper and lower observations, it does have some useful applications. In Industry the range for measurements in items coming off an assembly line might be specified in advance. As long as all measurements fall within the specified range, the process is said to be in the control.

**16.7.2. Mean Deviation**

Another measure of dispersion is the mean deviation. As the range suffers from the serious drawback, that is, it is not based on all observations of the series, the composition of series is entirely ignored. To avoid this defect, dispersion is calculated taking into consideration all the observations of the series in relation to a central value. First of all, we consider the mean, or average deviation.

The mean deviation or average deviation of  $n$  observations is equal to the sum of the absolute values of the deviations from the mean divided by  $n$ .

Theoretically, there is an advantage in taking the deviations from the median because the sum of the deviations of items from median is minimum when signs are ignored. However, in practice, the A.M. is frequently used in calculating the deviations. Due to this reason, this measure of variability is known as mean deviation or average deviation.

**Computation of Mean Deviation****Individual observations (Discrete series)**

In case of individual observations, the following is the formula for its calculation.

$$\text{Mean Deviation} = \frac{\Sigma/D/}{N}$$

Where D = deviations of items from median or mean as the case may be.

N = Number of observations.

**Example 3 :**

The mean of the five scores, 6, 8, 10, 12 and 14 is 10 and the deviations of the separate scores from this mean are 6 - 10 or - 4, 8 - 10 = -2, 10 - 10 = 0, 12 - 10 or 2, 14 - 10 or 4. The sum of these 5 deviations disregarding signs, is 12 and dividing 12 by 5 (N) we get 2.4 as the mean deviation.

**Example 4 :**

Study the gain in weight for 65 children during a specified period from the data of Table 4.1.

**TABLE 4**

<b>Gain in weight in Kg</b>	<b>Number of Children</b>
9	4
8	7
7	9
6	11
5	12
4	9
3	6
2	4
1	3
	N = 65

**Solution :**

Gain in kg	Number of children (f)	Comulative frequency	Deviation from Median		FIDI
			D	/D/	
9	4	65	4	4	16
8	7	61	3	3	21
7	9	54	2	2	18
6	11	45	1	1	11
5	12	34	0	0	0
4	9	22	-1	1	9
3	6	13	-2	2	12
2	4	7	-3	3	12
1	3	3	-4	4	12
	<b>N = 65</b>				<b><math>\Sigma f  D  = 111</math></b>

Median = Size of N/2th item

= Size of 65/2th item

= Size of 32.5<sup>th</sup> item

= 5

$$\text{Mean Deviation} = \frac{\Sigma f / D /}{N}$$

$$= 111 / 65 = 1.71$$

### **Calculate of Mean Deviation in Continuous Series**

While finding the mean deviation for continuous series, we take mid-points of the various classes and take deviations of these mid-points from median.

**Example 5 :**

Calculation of Mean Deviation.

C. I.	f	c.f.	m.p.(m)	m-35.2   D	f   D
0 - 10	7	7	5	30.2	211.4
10 - 20	12	19	15	20.2	242.4
20 - 30	18	37	25	10.2	183.6
30 - 40	25	62	35	0.2	5.0
40 - 50	16	78	45	9.8	154.8
50 - 60	14	92	55	19.8	277.2
60 - 70	8	100	65	29.8	238.4
	<b>f = 100</b>				<b>Σf   D   = 1315</b>

Here Median =  $30 + \frac{50 - 37}{25} \times 10 = 30 + 5.2 = \left( 35.2 \right)$

$$\text{Mean Deviation} = \frac{\Sigma f/D/}{N} = \frac{1315}{100} = 13.15$$

Here the formula used is : Mean Deviation =  $\frac{\Sigma f/D/}{N}$

**Example 6 :**

a) Calculte the man deviation from mean for the following series. Also find out its coefficient.

Mark	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. of Students	5	8	15	16	6

**Solution :**

**CALCULATION OF MEAN DEVIATION FROM MEAN**

Marks	m.p. m	f	(m-25)/10 df	fd'	D	fd
0 - 10	5	5	-2	-10	22	110
10 - 20	15	8	-1	8*	12	96
20 - 30	25	15	0	0	2	30
30 - 40	35	16	+1	+16	8	128
40 - 50	45	6	+2	+12	18	108
		N = 150	$\Sigma fd' = +10$		$\Sigma f  D  = 472$	

$$\bar{X} = A + \frac{\Sigma fd'}{N} \times C$$

$$A = 25, \Sigma fd' = 10, N = 50, C = 10$$

$$\therefore X = 25 + \frac{10}{50} \times 10 = 27$$

$$M, D, = \frac{\Sigma f |D|}{N} = \frac{472}{50} = 9.44$$

$$\text{Coeff. of M. D.} = \frac{M. D.}{\text{Mean}} = \frac{9.44}{27} = 0.35$$

**16.7.4 Merits and Limitations of Mean Deviation**

**Merits :**

- (i) The outstanding advantage of the average deviation is its relative simplicity. It is simple to understand and easy to compute. Any one familiar with the concept of the average can readily appreciate the meaning of the average deviation. If a situation requires a measure of dispersion that will be presented to the general or

any group not very familiar within statistics, the average deviation is useful.

- (ii) It is based on each and every item of the data. Consequently change in the value of any item would change the value of mean deviation.
- (iii) Mean deviation is less affected by the value of extreme items than the standard deviation.
- (iv) Since deviation are taken from a central value, comparison about formation of different distributions can easily be made.

Limitations (i) The greatest drawback of this method is that algebraic signs are ignored while taking the deviations of the items.

#### 16.7.4 Quartile Deviation

Quartile deviation is one-half of the difference between third quartile and the first quartile of a series. Generally, it is called as semi-inter Quartile Range. The following is the formula for its calculation.

$$\text{Semi-inter Quartile Range (Q.D.)} = \frac{Q_3 - Q_1}{2} \text{ and Inter-quartile Range} = Q_3 - Q_1$$

Where Q. D. stands for Quartile Deviation.

$Q_3$  for the Third Quartile and  $Q_1$  for the First Quartile

#### Example 7 :

Calculate the semi-inter Quartile Range of the following class-interval :

CI:	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17
f:	5	5	10	15	42	51	22	5	5

#### Solution :

**TABLE**

Class-interval Score	Frequency	Cumulative frequency (CF)
16 - 17	5	160
14 - 15	5	155
12 - 13	22	150
10 - 11	51	128
8 - 9	42	77
6 - 7	15	35
4 - 5	10	20
2 - 3	5	10
0 - 1	5	5
	<b>N = 160</b>	

$$Q_1 = \text{Size of } \left(\frac{n}{4}\right) \text{th item} = \text{Size of } \left(\frac{160}{4}\right) \text{th item}$$

= Size of 40<sup>th</sup> item which is in (8 - 9) class interval

$$Q_1 = 1 + \left[ \frac{\frac{N}{4} - CF}{f} \right] \times i = 7.5 + \frac{40 - 35}{42} \times 2 = 7.74$$

$$Q_3 = \text{Size of } (3/4N) \text{th item} - \text{size of } 3 (160/4) \text{th item}$$

= Size of 120<sup>th</sup> item which is in (10-11) class interval

$$Q_3 = 1 + \left[ \frac{3/4 N - CF}{f} \right] \times i = 9.5 + \frac{120 - 77}{51} \times 2 = 11.19$$

$$\text{Internal Quartile range} = Q_3 - Q_1 = 11.9 - 7.74 = 3.45$$

### Individual Observations (Discrete series)

**Example 8 :** Find out the value of quartile deviation and its coefficient from the following data :

Roll No.	1	2	3	4	5	6	7
Marks	20	28	40	12	30	15	50

**Solution :**

Marks arranged in ascending order : 12 15 20 28 30 40 50

$$Q_1 = \text{Size of } \frac{N+1}{4} \text{ th item} = \text{size of } \frac{7+1}{4} \text{ th item} = 2^{\text{nd}} \text{ item}$$

Size of 2nd item is 15,  $\therefore Q_1 = 15$

$$= \text{Size of 3rd } \frac{N+1}{4} \text{ th item} = \text{size of } \frac{3 \times 8}{4} \text{ th item} = 6^{\text{th}} \text{ item}$$

This  $Q_3 = 40$

$$Q. D. = \frac{Q_3 - Q_1}{2} = \frac{40 - 15}{2} = \frac{25}{2} = 12.5$$

$$\text{Coefficient of Q. D.} = \frac{Q_3 - Q_1}{Q_3 + Q_1} = \frac{40 - 15}{40 + 15} = \frac{25}{55} = 0.455$$

### Continuous Series

**Example 9 :** The following table gives the heights of students in a class. Find out the quartile deviation and its coefficient.

Height (inches)	50 - 53	53 - 55	56 - 59	5 - 52	63 - 65	65 - 68
No. of Students	2	7	24	27	13	3

**Solution :**

**TABLE**

Height	No. of Students	c.f.
50 - 53	2	2
53 - 56	7	9
56 - 59	24	33
59 - 62	27	60
62 - 65	13	73
65 - 68	3	76

$$Q. D. = \frac{Q_3 - Q_1}{2}$$

$$\text{Lower Quartile : } Q_1 = \text{Size of } \frac{N}{4} \text{ th item} = \frac{76}{4} = 19^{\text{th}} \text{ item}$$

$Q_1$  lies in the class 56 - 59. But the real limit of this class is 55.6 - 59.5

$$Q_1 = L + \frac{N/4 - \text{c.f.}}{f} \times i = 55.5 + 19 - 9/24 \times 4 = 53.3$$

$$L = 55.5, N/4 = 19, \text{c.f.} = 9, f = 24, i = 4$$

$$\text{Upper Quartile : } Q_3 = \text{Size of } \frac{3N}{4} \text{ th item} = \frac{3 \times 76}{4} = 57^{\text{th}} \text{ item}$$

$Q_3$  lies in the class 59 - 62. But the real limit of this class is 58.3 - 62.5

$$Q_3 = L + \frac{3N/4 - \text{c.f.}}{f} \times i$$

$$= 58.5 + \frac{57 - 33}{27} \times 4 = 58.5 + 3.56 = 62.06$$

$$Q. D. = \frac{62.06 - 53.83}{2} = 4.115$$

$$\text{Coefficient of Q. D.} = \frac{Q_3 - Q_1}{Q_3 + Q_1} = \frac{62.06 - 53.83}{62.06 + 53.83} = \frac{8.23}{115.89} = 0.071$$

### 16.7.5 Merits and Limitations of Quartile Deviation

#### Merits

- (i) In certain respects it is superior to range as a measure of dispersion.
- (ii) It has a special utility in measuring variation in case of open-end distributions or one in which the data may be ranked but measured quantitatively.
- (iii) It is also useful in erratic or badly skewed distributions, where the other measures of dispersion would be warped by extreme values. The quartile deviation is not affected by the presence of extreme values.

#### Limitations :

- (i) Quartile deviation ignores 50% items, i.e. the first 25% and the last 25%. As the value of quartile deviation does not depend upon every item of the series it cannot be regarded as a good method of measuring dispersion.
- (ii) It is not capable of mathematical manipulation.
- (iii) Its value is very much affected by sampling fluctuations.

#### Exercises :

1. Explain the use of statistics in the field of education.
2. What is the meaning of Mean deviation (MD)
3. Define different measures of variability along their merits and limitations.
4. Calculate the mean deviation (MD) for the following scores.
5. Calculate the  $Q_1$ ,  $Q_3$  and QD for the following data.

Marks	10	20	30	40	50	80
No. of Students	4	7	15	8	7	2

**Suggested Reading :**

1. Gakhar, S. C. (2009) Statistics in Education and Psychology. N. M. Publication Panipat.
2. Garrett, H.E. (1990) Statistics in Psychology and Education, Published by G.U. Mehta for Vakils Feffer and Simons Pvt. Ltd., Bombay.

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**THE STANDARD DEVIATION, PERCENTILES AND PERCENTILE RANK**

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**17.1 Objectives**

After the lesson student will be able to

1. describe the meaning and definition of standard deviation.
2. differentiate mean deviation and standard deviation.
3. calculate the standard deviation with the help of actual mean, assumed mean, in a continues series.
4. state the properties of SD such as variance.
5. list the merits and limitation of standard deviation.
6. state the meaning of percentile rank and percentiles.
6. calculate the percentile rank and percentiles.

**17.2 INTRODUCTION**

The standard deviation concept was introduced by Karl Parson in 1823. It is by far the most important and widely used measure of studying dispersion. Its significance lies in the fact that it is free from those defects from which the earlier methods suffer and satisfies most of the properties of a good measure of dispersion. Standard deviation is also known as root-mean square deviation for the reason that it is the square root of the means of the squared deviations from the arithmetic mean. Standard deviation is denoted by the small Greek latter  $\sigma$  (read as sigma).

### **17.3 MEANING OF THE TERM STANDARD DEVIATION**

The standard deviation measures the absolute dispersion or variability of a distribution : the greater the amount of dispersion or variability the greater the standard deviation for the greater will be the magnitude of the deviations of the values from their mean.

### **17.4 DEFINITION OF STANDARD DEVIATION**

A small standard deviation means a high degree of uniformity of the observation as well as homogeneity of a series; a large standard deviation means just the opposite. Thus if we have two or more comparable series with identical or nearly identical means, it is the distribution with the smallest standard deviation that has the most representative mean. Hence standard deviation is extremely useful in judging the representativeness of the mean.

#### **17.4.1 Difference between Mean Deviation and Standard Deviation**

Both these measures of dispersion are based on each and every item of the distribution. But they differ in the following respects :

- (i) Algebraic signs are ignored while calculations mean deviation whereas in the calculation of standard deviation signs are taken into account.
- (ii) Mean deviation can be computed either from median or mean. The standard deviation, on the other hand, is always computed from the arithmetic mean because the sum or the squares of the deviation of items from arithmetic mean is least.

### **17.5 CALCULATION OF STANDARD DEVIATION - INDIVIDUAL OBSERVATIONS**

In case of individual observations standard deviation may be computed by applying any of the following two methods :

1. By taking deviation of the items from an actual mean.
2. By taking deviations of the items from an assumed mean.

**Deviations taken from Actual Man.** When deviations are taken from actual mean the following formula is applied :

$$\sigma = \sqrt{\frac{\sum x^2}{N}} ; x = (X - \bar{X})$$

**Steps :**

- (i) Calculate the actual man of the series, i.e.  $\bar{X}$ .
- (ii) Take the deviations of the items from the mean, i.e., find  $(X - \bar{X})$ . Denote these deviations by  $x$ .
- (iii) Square these deviations and obtain the total  $\sum x^2$ .
- (iv) Divide  $\sum x^2$  by the total number of observation, i.e.,  $N$  and extract the square-root. This gives us the value of standard deviation.

**Deviations taken from Assumed Mean :** When the actual mean is in fractions, say, it is 123.674 it would be too cumbersome to take deviation from it and then obtain squares of these deviations. In such a case either the man may be approximated or else the deviations be taken from an assumed mean and the necessary adjustment made in the value of the standard deviation. The former method of approximation is less accurate and therefore, invariably in such a case deviations are taken from assumed mean.

When deviations are taken from assumed mean the following formula is applied :

$$\sigma = \sqrt{\frac{\sum d^2}{N} - \left(\frac{\sum d}{N}\right)^2}$$

**Steps :**

- (i) Take the deviations of the items from an assumed mean. i.e. obtain  $(X - A)$ . Denote these deviations by  $d$ . Take the total of these deviations, i.e., obtain,  $\sum d$ .
- (ii) Square these deviations and obtain the total  $\sum d^2$
- (iii) Substitute the values of  $\sum d^2$ ,  $\sum d$  and  $N$  in the above formula.

**Example 1 :**

- (a) Blood serum cholesterol levels of 10 persons are as under : Calculate SD with the help of assumed mean.

240, 260, 290, 245, 255, 288, 272, 268, 277, 251

**Solution :**

**TABLE**

<b>X</b>	<b>(X-264)*</b>	<b>d<sup>2</sup></b>
240	- 24	576
260	- 4	16
290	+26	676
245	-19	361
255	-9	81
288	+24	573
272	+8	64
263	-1	1
277	+13	169
251	-13	169
<b><math>\Sigma X^2 = 2641</math></b>	<b><math>\Sigma d = +1</math></b>	<b><math>\Sigma d^2 = 2689</math></b>

$$\sigma = \sqrt{\frac{\Sigma d^2}{N} - \left(\frac{\Sigma d}{N}\right)^2}$$

Here,  $\Sigma d^2 = 2689$ ,  $\Sigma d = +1$ ,  $N = 10$

$$\therefore \sigma = \sqrt{\frac{2689}{10} - \left(\frac{1}{10}\right)^2} = \sqrt{268.9 - 0.1} = 16.398.$$

**17.5.2 Assumed Mean Method.** When this method is used the following formula is applied :

$$s = \sqrt{\Sigma \frac{fd^2}{N} - \left(\frac{\Sigma fd}{N}\right)^2} \quad \text{Where } d = (x - A)$$

**Steps :**

- (i) Take the deviations of the items from an assumed mean and denote these deviations by d.
- (ii) Multiply these deviations by the respective frequencies and obtain the total,  $\Sigma fd$ .
- (iii) Obtain the squared for the deviations, i.e., calculate  $d^2$ .
- (iv) Multiple the squared devaitions by the respective frequencies, and obtain the total,  $\Sigma fd$ .
- (v) Substitute the values in the above formula.

**Example 3 :**

Calculate the standard deviation from the data given below :

Size of item	Frequency	Size of item	Frequency
3.5	3	7.5	85
4.5	7	8.5	32
5.5	22	9.5	8
6.5	60		

**Solution :**

**CALCULATION OF STANDARD DEVIATION**

<b>X</b> <b>Size of item</b>	<b>f</b>	<b>(X - 6.5)</b>	<b>fd'</b>	<b>fd'<sup>2</sup></b>
3.5	3	-3	-9	27
4.5	7	-2	-14	28
5.5	22	-1	-22	22
6.5	60	0	0	0
7.5	85	+1	+85	85
8.5	32	+2	+64	128
9.5	8	+3	+24	72
	<b>N = 217</b>		<b>Σfd' = +128</b>	<b>Σfd'<sup>2</sup> = 362</b>

$$\sigma = \sqrt{\frac{\Sigma d'^2}{N} - \left(\frac{\Sigma d'}{N}\right)^2}$$

where  $\Sigma fd'^2 = 362$ ,  $\Sigma fd' = 128$ ,  $N = 217$

$$\therefore \sigma = \sqrt{\frac{362}{217} - \left(\frac{128}{217}\right)^2} = \sqrt{1.668 - .348} = 1.149$$

**17.5.3. Step Deviation Method**

When this method is used we take a common factor from the given data. The formula for computing standard deviation is :

$$\sigma = \sqrt{\frac{\Sigma fd'^2}{N} - \left(\frac{\Sigma fd'}{N}\right)^2} \times i$$

Where,  $d' = \frac{(X - A)}{C}$  and  $i$  is size of class interval

**Example 4 :**

Find the standard deviation for the following distribution.

X:	4.5	14.5	24.5	34.5	44.5	54.5	64.5
f:	1	5	12	22	17	9	4

**Solution :**

**TABLE**

		(X-34.5)/10		
<b>X</b>	<b>f</b>	<b>d</b>	<b>fd'</b>	<b>fd'<sup>2</sup></b>
4.5	1	-3	-3	9
14.5	5	-2	-10	20
24.5	12	-1	-12	12
34.5	22	0	0	0
44.5	17	+1	+17	17
54.5	9	+2	+18	36
64.5	4	+3	+12	36
	<b>N = 70</b>		<b>Σfd' = 22</b>	<b>Σfd'<sup>2</sup> = 130</b>

$$\sigma = \sqrt{\frac{\sum fd'^2}{N} - \left(\frac{\sum fd'}{N}\right)^2} \times i$$

Where  $\sum fd'^2 = 130$ ,  $\sum fd' = 22$ ,  $C = 10$ ,  $N = 70$

$$\sigma = \sqrt{\frac{130}{70} - \left(\frac{22}{70}\right)^2} \times 10$$

$$= \sqrt{1.85 - 0.9} \times 10$$

$$= 1.326 \times 10$$

### 17.5.4 Calculate of Standard Deviation - Continuous Series

$$= \sqrt{\frac{\sum fd'^2}{N} - \left(\frac{\sum fd'}{N}\right)^2} \times i$$

#### Example 5 :

Calculate SD for the following data :

C. I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f	6	5	15	10	5	4	3	2

#### Solution :

TABLE

Class Interval	m.p. m.	(m-22.5)/5 d	f	fd'	fd' <sup>2</sup>
5 - 10	7.5	-3	6	-18	+54
10 - 15	12.5	-2	5	-10	+20
15 - 20	17.5	-1	15	-15	+15
20 - 25	22.5	0	10	0	0
25 - 30	27.5	+1	5	+5	+5
30 - 35	32.5	+2	4	+8	+16
35 - 40	37.5	+3	3	+9	+27
40 - 45	42.5	+4	2	+8	+32
			N = 50	∑fd' = -13	∑fd' <sup>2</sup> = 169

$$\sigma = \sqrt{\frac{\sum fd'^2}{N} - \left(\frac{\sum fd'}{N}\right)^2} \times i$$

$$\sigma = \sqrt{\frac{169}{50} - \left(\frac{-13}{50}\right)^2} \times 5 = \sqrt{3.38 - .67} \times 5 = 9.1$$

**Example 6 :**

Find the standard deviation of the following distribution :

Age:	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50
No. of person	170	110	80	45	40	35

**Solution :**

Take assumed average = 32.5

**TABLE**

Age	m.p. m	No. of person f	(m-32.5)/5 d	fd'	fd' <sup>2</sup>
20 - 25	22.5	170	-2	-340	680
25 - 30	27.5	110	-1	-110	110
30 - 35	32.5	80	0	0	0
35 - 40	37.5	45	+1	+45	45
40 - 45	42.5	40	+2	+80	160
45 - 50	47.5	35	+3	+105	315
		N = 480		Σfd' = -220	Σfd' <sup>2</sup> = 1310

$$\sigma = \sqrt{\frac{\sum fd'^2}{N} - \left(\frac{\sum fd'}{N}\right)^2 \times i}$$

$$\sum fd'^2 = 1310, N = 480, \sum fd' = -220, C = 5$$

Substituting the values

$$\begin{aligned} \sigma &= \sqrt{\frac{1310}{480} - \left(\frac{-220}{480}\right)^2 \times 5} = \sqrt{2.729 - .21} \times 5 = 9.1 \sqrt{2.519} \times 5 \\ &= 1.587 \times 5 = 7.936 \end{aligned}$$

## 17.6 MATHEMATICAL PROPERTIES OF STANDARD DEVIATION

Standard deviation has some very important mathematical properties which considerably enhance its utility in statistical work.

**TABLE**

**Solution :**

			(m-32)/4		
Marks	m	f	d	fd'	fd' <sup>2</sup>
10 - 14	12	2	-5	-10	50
14 - 15	16	4	-4	-16	64
18 - 22	20	4	-3	-12	36
22 - 26	24	8	-2	-16	32
26 - 30	28	12	-1	-12	12
30 - 34	32	16	0	0	0
34 - 38	36	10	+1	+10	10
38 - 42	40	8	+2	+16	32
42 - 46	44	4	+3	+12	36
46 - 50	48	6	+4	+24	96
50 - 54	52	2	+5	+10	50
54 - 58	56	4	+6	+24	144
		N = 80		Σfd' = 30	Σfd' <sup>2</sup> = 562

$$\text{Variance} = \left[ \frac{\Sigma fd'^2}{N} - \left( \frac{\Sigma fd'}{N} \right)^2 \right] \times i^2$$

$$\Sigma fd'^2 = 562, \Sigma fd' = 30, N = 80, i = 4$$

$$\text{Variance} = \left[ \frac{562}{80} - \left( \frac{30}{80} \right)^2 \right] \times 4^2 = (7.025 - 0.141) \times 16$$

## 17.7 MERITS AND LIMITATIONS OF STANDARD DEVIATION

### Merits

- (i) The standard deviation is the best measure of variation because of its mathematical characteristics. It is based on every item of the distribution. Also it is amenable to algebraic treatment and is less affected by fluctuations of sampling than most other measures of dispersion.
- (ii) It is possible to calculate the combined standard deviation of two or more groups. This is not possible with any other measure.
- (iii) For comparing the variability of two or more distribution coefficient of variation is considered to be most appropriate and this is based on mean and standard deviation.
- (iv) Standard deviation is most prominently used in further statistical work. For example, in computing skewness, correlation etc. use is made of standard deviation. It is a key note in sampling and provides a unit of measurement for the normal distribution.

### Limitations.

- (i) As compared to other measures it is difficult to compute. However, it does not reduce the importance of this measure because of high degree of accuracy of results it gives.
- (ii) It gives more weight to extreme items and less to those which are near the mean. It is because of the fact that the squares of the deviations which are big in size would be proportionately greater than the squares of those deviations which are comparatively small. The deviations 2 and 8 are in the ratio of 1 : 4 but their squares; i.e., 4 and 64, would be in the ratio of 1 : 16.

## 17.8 COEFFICIENT OF VARIATION

The standard deviation discussed above is an absolute measure of dispersion. This corresponding relative measure is known as the coefficient of variation. This measure developed by Karl Pearson is the most commonly used measure of relative variation. It is used in such problems where we want to compare the variability of two or more than two series. That series (or group for which the coefficient of variation is greater is said to be more variable or conversely less consistent, less uniform, less stable or less homogeneous. On the other hand, the series for which coefficient of variation is less is said to be less variable or more consistent, more uniform, more stable or more homogeneous. Coefficient of variation is denoted by C. V. and is obtained as follows :

$$\text{Coefficient of variation or C. V.} = \frac{\sigma}{X} \times 100$$

It may be pointed out that although any measure of dispersion can be used in conjunction with any average in computing relative dispersion, statisticians, in fact, almost always use the standard deviation as the measure of dispersion and the arithmetic mean as the average. When the relative dispersion is stated in terms of the arithmetic mean and the standard deviation, the resulting percentage is known as the coefficient of variation or coefficient of variability.

### Example 7 :

Calculate coefficient of variation from the following data;

		<b>Income</b>	<b>No. of families</b>
Less	than	700	12
”	”	800	30
”	”	900	50
”	”	1000	75
”	”	1100	110
”	”	1200	120

**Solution :**

**TABLE**

Income Rs.	m. p.	f	(m-950/100 d	fd'	fd' <sup>2</sup>
600 - 700	650	12	-3	-36	108
700 - 800	750	18	-2	-36	72
800 - 900	850	20	-1	-20	20
900 - 1000	950	25	0	0	0
1000 - 1100	1050	35	+1	+35	35
1100 - 1200	1150	10	+2	+20	40
		N = 120		Σfd' = -37	Σfd' <sup>2</sup> = 275

$$C. V. = \frac{\sigma}{X} \times 100$$

$$\text{Mean} : \bar{X} = A + \frac{\Sigma fd'}{N} \times i$$

$$A = 950, \Sigma fd' = -37, N = 120, C = 100$$

$$M = \bar{X} = 950 - \frac{37}{120} \times 100 = 950 - 30.833 = 919.167$$

$$S. D. : \sigma = \sqrt{\frac{\Sigma fd'^2}{N} - \left(\frac{\Sigma fd'}{N}\right)^2} \times i$$

$$\sigma = \sqrt{\frac{275}{120} - \left(\frac{-37}{120}\right)^2} \times 100 = \sqrt{2.292 - .095} \times 100 = 1.482 \times 100 = 148.2$$

$$C. V. = \frac{148.2}{919.166} \times 100 = 16.13 \text{ per cent}$$

## 17.5 PERCENTILE RANK

The percentile rank is the position on a scale of 100 to which the subject's score entitles him (Garrett, 1958)

In case of discrete series, PR is calculated.

$$PR = 100 R/N$$

In case of grouped data the following formula can be used.

$$PR = (F + X-L / l \times F) \times 100/N$$

The following steps might be followed :

- (i) Find the lower limit 'L' of the class containing the score 'X' whose percentile rank is to be calculated.
- (ii) Find out per unit interval by dividing the frequency of the size of the class-interval ( $f/l$ ).
- (iii) Find the difference between 'X' and the lower limit of the class containing it i.e.  $X - L$ .
- (iv) Multiple the difference by the per unit interval.
- (v) Add the above product to the cumulative frequency F just below that interval.
- (vi) Divide the above by the total number of cases and multiply the quotient by 100. The produce obtained would be the percentile rank of the individual whose sum has been given.

**Example 8:****TABLE**

<b>Class Interval (Scores)</b>	<b>Frequency (f)</b>	<b>Cumulative frequency (F)</b>
95 - 100	4	200
90 - 95	4	196
85 - 90	10	192
80 - 85	20	182
75 - 80	42	162
70 - 75	50	120
65 - 70	20	70
60 - 65	20	50
55 - 60	10	30
50 - 55	8	20
45 - 50	8	12
40 - 45	4	4
	N = 200	

Here the score  $X = 72$  falls in the class interval 70 -75. The lower limit of this interval  $L = 69.5$ .

$$\text{The difference } X - L = 72 - 69.5 = 2.5$$

And per unit of the interval is  $50/5 = 10$ , the product of the difference and per unit interval =  $2.5 \times 10 = 25.0$ , Part of the total number of cases.

$$= F + (X-L) f/l = 70 + 25 = 95$$

$$PR = 95.0 / 200 \times 100 = 47.5$$

The individual would occur 48<sup>th</sup> PR.

### 17.9.1 Use of the Percentile Rank

The percentile rank is useful when one wants to know the position of a student in two different subjects. However, it is not an accurate method. It has some limitations. The percentile norms are generally calculated when the achievement of an individual in a number of subjects is to be compared.

### 17.10 PERCENTILES

Percentiles are the points in a frequency distribution below which a given percentage of cases lie and which divide the entire scale of measurement into 100 equal parts.

$P_1, P_2, P_3, P_4, P_5 \dots P_{99}, P_{100}$

For example 20th percentile or  $P_{20}$  is a point below which 20% cases lie.

The formula for calculating any percentile is given below :

$P_p = l + (PN - F/f_p) i$ , where

$P$  = percentage of the frequency distribution wanted.

$l$  = lower limit of the class - interval  $l$  in which  $P$  lies.

$PN$  = Part of  $N$  to be counted off in order to reach  $P$

$F$  = sum of all scores upon intervals below  $l$ .

$f_p$  = frequency against the interval in which  $P$  lies.

$i$  = length of the class - interval.

**Example 9 :****TABLE**

<b>Class interval (Scores)</b>	<b>f</b>	<b>F</b>	<b>Percentiles</b>
110 - 119	2	150	P100 = 119.50
100 - 109	4	148	P90 = 88.07
90 - 99	7	144	P80 = 78.14
80 - 89	14	137	P70 = 71.32
70 - 79	22	123	P60 = 66.00
60 - 69	32	101	P50 = 61.38
50 - 59	27	69	P40 = 56.17
40 - 49	20	42	P30 = 50.61
30 - 39	10	22	P20 = 43.50
20 - 29	7	12	P10 = 32.50
10 - 19	4	5	
0 - 9	1	1	
	N = 150		

**Calculate of Percentiles**

$$10\% \text{ of } 150 = 15,$$

$$P_{10} = 29.5 + (15-12/10) \times 10 = 32.50$$

$$20\% \text{ of } 150 = 30,$$

$$P_{20} = 39.5 + (30-22/20) \times 10 = 43.50$$

$$30\% \text{ of } 150 = 45,$$

$$P_{30} = 49.5 + (45 - 42/27) \times 10 = 50.61$$

**Exercise :**

1. Explain the meaning of standard deviation.
2. Find SD of 6, 8, 10, 12 and 14.
3. Find the standard deviation of the following scores.

Scores	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89
f	2	7	9	10	6	8	4	4

4. Define percentile and percentile rank
5. If 60 children are put in order of merit for grades in history, what are the PR's of the 1<sup>st</sup>, 10<sup>th</sup>, 45<sup>th</sup> and 60<sup>th</sup>.

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**LIMITATIONS OF STANDARD DEVIATION  
AND QUARTILE DEVIATION**

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**18.0 STRUCTURE**

- 21.1 Objectives
- 21.2 Advantages and Limitations of Standard Deviation
- 21.3 Advantages and Limitations of Quartile Deviation
- 21.4 Let Us Sum Up
- 21.5 Check Your Progress
- 21.6 Suggested Further Readings

**18.1 OBJECTIVES**

After going through this topic you are expected to-

- Explain the advantages and limitations of standard deviation.
- Explain the advantages and limitations of quartile deviation.

**18.2 ADVANTAGES AND LIMITATIONS OF STANDARD DEVIATION**

1. It is most widely used measure of dispersion of variability.
2. It is suitable for further algebraic treatment.
3. It is least affected by sampling fluctuations.
4. It is the most powerful measure of dispersion.
5. It is the best and comprehensive method for studying individual differences.

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*Ms. Puneet Kour, Assistant Prof. in Education, DDE, University of Jammu*

6. It is useful as a measure of variability in those situations when mean is a measure of central tendency.
7. It is the most reliable measure of variability.
8. It can also be used in those situations where extreme deviations have greater influence than other deviations.

**Limitations**

1. Extraction of square root is not comprehensible for a layman.
2. It gives greater weight to extreme values.
3. It is not easily understood. Those who are unfamiliar in statistical procedures, they find it difficult to interpret its meaning.

**18.3 ADVANTAGES AND LIMITATIONS OF QUARTILE DEVIATION**

1. It is easy to understand and calculate.
2. It is not affected by extreme observations.
3. It is a better measure than range as it makes use of 50% of data.
4. It can be computed with open ended class intervals.
5. It can be used even with those frequency distributions which have unequal class intervals.
6. It is the most useful measure of variability in which median is a measure of central tendency.
7. It is quite useful in small samples and when there are extreme measures in the distribution.

**Limitations**

1. It is not based on all observations of the data.
2. It ignores top and bottom 25% of the data.
3. It is easily affected by sampling fluctuations.
4. It is not suitable for further calculations.

#### **18.4 LET US SUM UP**

Looking into the advantages and limitations of various measures of variability. It is clear that standard deviation should be generally used as a best measure of variability. It has more advantages and is least affected by the sampling fluctuations. It is more stable and is the only statistical device for describing status or position of an individual in a group. Moreover, the choice depends upon the sampling statistics and relative constancy in repeated sampling in case of large sample, so the standard deviation is the only measure which fulfils these properties of sampling distribution.

#### **18.5 CHECK YOUR PROGRESS**

1. Explain the advantages and limitations of standard deviation.
2. Explain the advantages and limitations of quartile deviation.

#### **18.6 SUGGESTED FURTHER READINGS**

1. Bhatnagar, S. and Saxena A. (2001), Advanced Educational Psychology, Surya Publications, Meerut, India
2. Damral, B.D. (2003) : Foundations of Education Psychology.
3. Kulshreshtha, S.P. (2001) : Educational Psychology.
4. Saxena, Anamika (2000 – 2001) : Advanced Educational Psychology.
5. Verma and Sharma : Statistics in Education and Psychology, Narendra Publishing House, Jalandhar.

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**CORRELATION**

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**19.1 Objectives**

To enable students

1. to understand the meaning of correlation.
2. to understand the types of correlation.
3. to understand the limits of correlation.
4. to find the coefficient of correlation with the help of Karl Pearson's Method.
5. to find the correlation with the help of Rank difference method of correlation.

**19.2 INTRODUCTION**

The correlation is the study of relationship of one variable to another. Thus there is correlation between the two series of statistical data. We consider the data about the prices of a commodity and the quantities sold at different prices. Various prices of the commodity on different prices provide one variable and the quantities sold at these prices provide the second variable. With increase in the price of commodity the quantity sold is bound to decrease. We observe that there is some relationship between price and demand. The degree of relationship between the variables under consideration is measured through the correlation analysis. Hence the term correlation indicates the relationship between two such variables in which with changes in the values of one variable the values of the other variable also changes.

**19.3 MEANING OF CORRELATION**

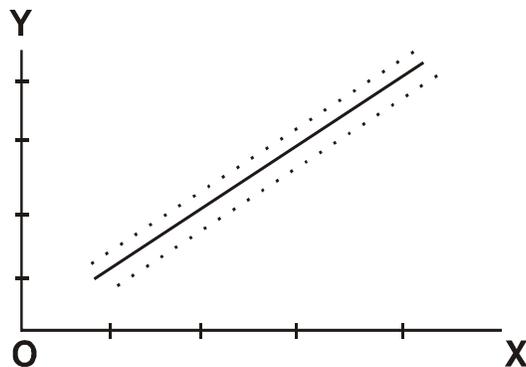
Correlation analysis refers to teh techniques used in measuring the lessons of relationship between the variables.

#### 19.4 DEFINITION OF CORRELATION

According to Simpson Kalka “Correlation analysis deals with the association between two or more variables.”

#### 19.5 TYPES OF CORRELATION

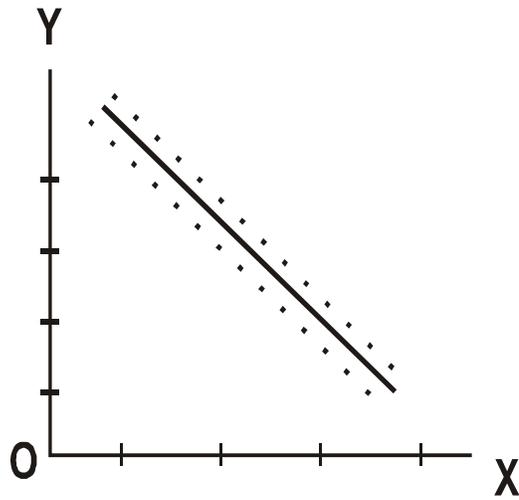
The measure of correlation is called the coefficient of correlation. It is denoted with the symbol  $r$ . It summarizes in one figure the direction and degree of correlation.



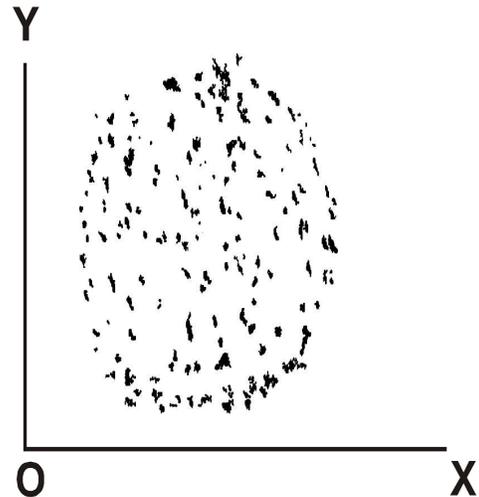
**Figure 1 : Positive Linear Correlation**

As we have defined the linear correlation coefficient to be a measure of the relationship between two random variables  $X$  and  $Y$ , and denoted it by  $r$ . If  $X$  and  $Y$  denote the two variables under consideration, a scater diagram shows the location points  $(X, Y)$  on a rectangular co-ordinate system. If all points in this scatter diagram seem to lie near a line, as in Fig 1 and 2, the correlation is linear.

If  $Y$  tends to increase as  $X$  increases, as in Fig. 1, the correlation is called **Positive** or direct correlation. If  $Y$  tends to decrease as  $X$  increases, as in Fig. 2, the correlation is called **Negative** or inverse correlation. If there is no relationship indicated between the variables, as in Fig. 3 we say that there is no correlation between them.



**Figure 2 : Negative Linear Correlation**



**Figure 3 : No Correlation**

### **19.6 IMPORTANCE OF THE STUDY OF CORRELATION**

1. Most of the variables show some kind of relationship. For example, there is relationship between price and supply, income and expenditure etc. With the help of correlation analysis we can measure in one figure the degree of relationship existing between the variables.
2. Once we know that two variables are closely related, we can estimate the value of one variable given the value of another. This is known with the help of regression analysis.
3. The effect of correlation is to reduce the range of uncertainty. The prediction based on correlation analysis is likely to be more variable and near to reality.

### **19.7 KARL PEARSON'S COEFFICIENT OF CORRELATION**



4. Square these deviations and obtain the total i.e.  $y^2$ .
5. To obtain  $xy$ , multiple  $x$  and  $y$  series and obtain the total.
6. Substitute the values of  $\Sigma xy$ ,  $\Sigma x^2$  and  $\Sigma y^2$  in

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \times \Sigma y^2}}$$

**Example 1 :**

Calculate the coefficient of correlation between X and Y for the data given below

:

X:	15	18	30	27	25	23	30
Y:	7	10	17	16	12	13	9

**Solution :**

**TABLE**

<b>X</b>	<b>X - <math>\bar{X}</math> = x</b>	<b>x<sup>2</sup></b>	<b>Y</b>	<b>Y - <math>\bar{Y}</math> = y</b>	<b>y<sup>2</sup></b>	<b>xy</b>
15	-9	81	7	-5	25	45
18	-6	36	10	-2	4	12
30	6	36	17	5	25	30
27	3	9	16	4	16	12
25	1	1	12	0	0	0
23	-1	1	13	1	1	-1
30	6	36	9	-3	9	-18
<b><math>\Sigma X</math></b>	<b><math>\Sigma X</math></b>	<b><math>\Sigma x^2</math></b>	<b><math>\Sigma Y</math></b>	<b><math>\Sigma y = 0</math></b>	<b><math>\Sigma y^2</math></b>	<b><math>\Sigma xy</math></b>
<b>= 168</b>	<b>= 0</b>	<b>= 200</b>	<b>= 84</b>		<b>= 80</b>	<b>= 80</b>

$$X = \frac{\Sigma X}{N} = \frac{168}{7} = 24, \quad Y = \frac{\Sigma Y}{N} = \frac{84}{7} = 12$$

$$\begin{aligned} \therefore r &= \frac{\Sigma xy}{\sqrt{\Sigma x^2 \times \Sigma y^2}} \\ &= \frac{80}{\sqrt{200 \times 80}} = \frac{80}{\sqrt{16000}} = \frac{80}{400} = 2/10 = +0.632 \end{aligned}$$

Hence the correlation is positive and is .632 in magnitude.

### When deviations are taken from an assumed mean

In the formula No. 1, if actual means are in fractions, the deviations x and y also come in fractions and the calculation of correlation involves too many calculations. In such cases we take the use of the assumed mean method, the formula for which is :

$$r = \frac{N \Sigma dx dy - (\Sigma dx) (\Sigma dy)}{\sqrt{N \Sigma dx^2 - (\Sigma dx)^2} \sqrt{N \Sigma dy^2 - (\Sigma dy)^2}} \quad \dots\dots (ii)$$

Where dx is the deviation of X series from an assumed mean A i.e. dx = X – A.

dy is the deviation of Y series from an assumed mean B i.e. dy = Y – B

$\Sigma dx dy$  = sum of the product of the deviations of X and Y series from their assumed means.

$\Sigma dx$  = sum of the deviations of X series from an assumed mean.

$\Sigma dx^2$  = sum of the square of the deviations of X series from an assumed mean.

$\Sigma dy$  = sum of the deviations of Y series from an assumed mean.

$\Sigma dy^2$  = sum of the square of the deviations of Y series from an assumed mean.

N = Number of pairs of observations.

**Example 2 :**

Find the correlation between the two sets of scores given below :

Subjects	X	Y
a	15	40
b	18	42
c	22	50
d	17	45
e	19	43
f	20	46
g	16	41
h	21	41

**Solution :**

Let Assumed mean for series X = 19

Let assumed mean for series y = 45

**Table**

Subjects	X	$dx = X-19$	$dx^2$	Y	$dy=Y-45$	$dy^2$	$dx dy$
a	15	-4	16	40	-5	25	20
b	18	-1	1	42	-3	9	3
c	22	+3	9	50	5	25	15
d	17	-2	4	45	0	0	0
e	19	0	0	43	-2	4	0
f	20	1	1	46	1	1	1
g	16	-3	9	41	-4	16	12
h	21	+2	4	41	-4	16	-8

Hence  $\Sigma dx = -4$ ,  $\Sigma dx^2 = 44$ ,  $\Sigma dy = -12$ ,  $\Sigma dy^2 = 96$ ,  $\Sigma dx dy = 43$

$$\begin{aligned}
 r &= \frac{N\Sigma dx dy - (\Sigma dx) (\Sigma dy)}{\sqrt{N\Sigma dx^2 - (\Sigma dx)^2} \sqrt{N \Sigma dy^2 - (\Sigma dy)^2}} \\
 &= \frac{(8)(43) - (-4) (-12)}{\sqrt{(8)(44) - (-4)^2} \sqrt{8 (96) - (-12)^2}} \\
 &= \frac{344 - 48}{\sqrt{352 - 16} \sqrt{768 - 144}} = \frac{296}{336 \times 624} = +0.65
 \end{aligned}$$

**Direct method of finding out correlation**

Correlation coefficient can also be calculated without taking deviations of items either from actual mean or assumed mean, i.e. actual X and Y values. The formula in such case is :

$$r = \frac{N\Sigma XY - (\Sigma X) (\Sigma Y)}{\sqrt{N\Sigma X^2 - (\Sigma X)^2} \sqrt{N \Sigma Y^2 - (\Sigma Y)^2}} \dots\dots\dots (iii)$$

The formula would give the same answer as we get when deviations of items are taken from actual mean or assumed mean. The following example shall illustrate the point.

**Example 3 :**

Calculate correlation coefficient from data of example 2 by the direct method, i.e., without taking the deviations of items from actual or assumed mean.

**Solution :**

<b>TABLE</b>				
<b>X</b>	<b>X<sup>2</sup></b>	<b>Y</b>	<b>Y<sup>2</sup></b>	<b>XY</b>
9	81	15	225	135
8	64	16	256	128
7	49	14	196	98
6	36	13	169	78
5	25	11	121	55
4	16	12	144	48
3	9	10	100	30
2	4	8	64	16
1	1	9	81	9

$$\Sigma X = 45 \quad \Sigma X^2 = 285 \quad \Sigma EY = 108 \quad \Sigma Y^2 = 1,356 \quad \Sigma XY = 597$$

$$N = 9, \Sigma XY = 597, \Sigma X = 45, \Sigma Y = 108 \quad \Sigma X^2 = 285 \quad \Sigma Y^2 = 1,356$$

$$r = \frac{9 \times 597 - 45 \times 108}{\sqrt{9 \times 285 - (45)^2} \sqrt{9 \times 1356 - (108)^2}}$$

$$r = \frac{5373 - 4860}{\sqrt{2565 - 2025} \sqrt{12204 - 11,664}} = \frac{513}{\sqrt{540}} = \frac{513}{540} = + 0.95$$

## 19.7 RANK CORRELATION

There are so many cases where a dependency between two variables X and Y can be observed but where the distribution is unknown. A statistics to measure the degree of association between variables X and Y where their distribution is unknown was developed by a statistician. **C. Spearman**, (1904) and called the Rank correlation coefficient. It is

based on the ranks (or order) of the observations and does not depend on a specific distribution of X and Y. Such a statistics that does not depend on a specific distribution of the variables is **called a non-parametric or distribution free statistics**.

This measure of correlation is known as rank difference coefficient of correlation and is denoted by  $\rho$  (rho)

$$\rho = 1 - \frac{6\sum d^2}{N(N^2 - 1)} \quad \dots \text{iv}$$

where  $\rho$  = rank coefficient of correlation

$d$  = difference of the corresponding ranks of the two sets of scores and  $N$  = size of sample.

### Steps For Computing

1. Rank the measure in order of size for X and Y separately.
2. Subtract the rank of each score of first series X from the corresponding rank for the second series Y. Denote the difference by  $d$ .
3. Square each value of the differences  $d$  and find  $d^2$ .
4. Find the sum of  $d^2$  i.e.  $\sum d^2$ .
5. Substitute the value of  $\sum d^2$  and  $N$  in the formula.

$$\rho = 1 - \frac{6\sum d^2}{N(N^2 - 1)}$$

### Example 4 :

A random sample of 5 college students is selected and their grades in a high school mathematics course and college mathematics course are found to be as shown in table. Find the rank coefficient of correlation.

**Solutions :**

**TABLE**

<b>High School grade</b>	<b>College grade</b>	<b>Rank of X</b>	<b>Rank of Y</b>	<b>d</b>	<b>d<sup>2</sup></b>
X	Y	R <sub>1</sub>	R <sub>2</sub>	(R <sub>1</sub> - R <sub>2</sub> )	
80	88	2	1	1	1
55	70	4	3	1	1
68	60	3	4	-1	1
35	45	5	5	0	0
85	75	1	2	-1	1
				<b>Σd = 0</b>	<b>Σd<sup>2</sup> = 4</b>

Using Spearman's rank correlation coefficient :

$$r = 1 - \frac{6\sum d^2}{N(N^2 - 1)} = \frac{(6)(4)}{(5)(5^2 - 1)} = \frac{1 - 24}{5 \times 24} = +0.8$$

### **Rank Correlation Coefficient With Tied Ranks**

Sometimes while arranging members of a group in order, a judge may be unable to discriminate between certain members. In such cases certain measurements are equal. For example, a teacher may give marks to his eight students as 16, 36, 48, 52, 52, 60. If we try to replace these marks by ranks we observe immediately that 36 occurs twice and 52 occurs thrice. Under these circumstances we assign to each number the average rank which the tied observations occupy. Thus 16 is ranked 1, the two 36's are ranked 2.5 and 2.5; the 48 is ranked 4; 52's are ranked 6, 6, 6 and the 60 is ranked 8. The following example will illustrate the solution.

**Example 5 :**

The table shows the respective masses X and Y of a sample of 12 fathers and their oldest sons.

Mass of father X (kg) 61 63 67 64 69 62 70 66 68 67 69 71

Mass of sons Y (kg) 68 66 68 65 69 66 68 65 71 67 68 70

Calculate the coefficient of rank correlation.

**Solution :**

Arranged in ascending order of magnitude, the father's masses are : 61, 62, 63, 64, 66, 67, 67, 68, 68, 69, 70, 71 since 6<sup>th</sup> and 7<sup>th</sup> place in this array represent the same mass (67 kg), we assign a mean rank 6.5 to these places. Similarly, the 8<sup>th</sup> and 9<sup>th</sup> places are assigned the rank 8.5. Thus the father's masses are assigned the ranks 1, 2, 3, 4, 5, 6.5, 6.5, 8.5, 8.5, 10, 11, 12.

Similarly, the son's masses arranged in ascending order of magnitude are : 65, 65, 66, 66, 67, 68, 68, 68, 68, 69, 70, 71. Now 1<sup>st</sup> and 2<sup>nd</sup> places represent the same mass (65) we assign 1.5 rank to both; In a same way 3<sup>rd</sup> and 4<sup>th</sup> places represent the same mass (66) and we assign 3.5 rank to both places. Since the 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> places represent the same mass (68 kg) we assign the mean rank

7.5 i.e  $\frac{(6+7+8+9)}{4}$  to these places. Thus the son's masses are assigned the

ranks : 1.5, 1.5, 3.5, 3.5, 5, 7.5, 7.5, 7.5, 7.5, 10, 11, 12.

**TABLE**

Mass of father	Mass of son	Rank of father	Rank of son	d (RX-RY)	d <sup>2</sup>
X	Y	RX	RY		
61	68	1	7.5	-6.5	42.25
63	66	3	3.5	-0.5	.25
67	68	6.5	7.5	-1.0	1.00
64	65	4	1.5	2.5	6.25
68	69	8.5	10	-1.5	2.25
62	66	2	3.5	-1.5	2.25
70	68	11	7.5	3.5	12.25
66	65	5	1.5	3.5	12.25
68	71	8.5	12	3.5	12.25
67	67	6.5	5	1.5	2.25
69	68	10	7.5	2.5	6.25
71	70	12	11	1.0	1.00
					Σd <sup>2</sup> = 100.50

Then :

$$p = 1 - \frac{6\Sigma d^2}{N(N^2 - 1)} = \frac{(6)(100.5)}{(12)(12^2 - 1)} = 6.5$$

**Example 6 :**

The ranking of 10 students in two subjects, Physica and Mathematics are as follows : Find coefficient of rank correlation.

Physics	3	5	8	4	7	10	2	1	6	9
Maths	6	4	9	8	1	2	3	10	5	7

**Solutions :**

Let rank in Physics be denoted by  $R_1$  and Maths by  $R_2$ .

**TABLE**

$R_1$	$R_2$	$d = (R_1 - R_2)$	$d^2 = (R_1 - R_2)^2$
3	6	3	9
5	4	1	1
8	9	1	1
4	8	4	16
7	1	6	36
10	2	8	64
2	3	1	1
1	10	9	81
6	5	1	1
9	7	2	4
			$\Sigma d^2 = 214$

$$p = 1 - \frac{6\Sigma d^2}{N^3 - N} = 1 - \frac{6 \times 214}{10^3 - 10} = 0.297$$

**Example 7 :**

Two ladies were asked to rank 7 different types of lipstics. The ranks given by them are given below : Find rank correlation.

<b>Lipstics</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Neelu	2	1	4	3	5	7	6
Neena	1	3	2	4	5	6	7

**Solutions :**

**TABLE**

<b>R<sub>1</sub></b>	<b>R<sub>2</sub></b>	<b>d = (R<sub>1</sub> - R<sub>2</sub>)</b>	<b>d<sup>2</sup> = (R<sub>1</sub> - R<sub>2</sub>)<sup>2</sup></b>
2	1	+1	1
1	3	-2	4
4	2	+2	4
3	4	-1	1
5	5	0	0
7	6	+1	1
6	7	-1	1
			$\Sigma d^2 = 12$

$$p = 1 - \frac{6\Sigma d^2}{N^3 - N} = 1 - \frac{6 \times 12}{7^3 - 7} = 1 - 0.214 = 0.786$$

**Example 8 :**

Ten competitors in a beauty contest are ranked by three judges in the following order :

1st Judge	1	6	5	10	3	2	4	9	7	8
2nd Judge	3	5	8	4	7	10	2	1	6	9
3rd Judge	6	4	9	8	1	2	3	10	5	7

Use the rank correlation coefficient to determine which pair of judges has the nearest approach to common tastes in beauty.

**Solution :**

In order to find out which pair of judges has the nearest approach to common tastes in beauty we compare Rank COrrrelation between the judgements of :

1. 1st Judge and 2nd Judge
2. 2nd Judge and 3rd Judge, and
3. 1st Judge and 3rd Judge

Rank by 1st Judge $R_1$	Rank by 2 Judge $R_2$	Rank by 3rd Judge $R_3$	$(R_1-R_2)^2$ $= d_1^2$	$(R_2-R_3)^2$ $= d_2^2$	$(R_3-R_1)^2$ $= d_3^2$
1	3	6	4	9	25
6	5	4	1	1	4
5	8	9	9	1	16
10	4	8	36	16	4
3	7	1	16	36	4
2	10	2	64	64	0
4	2	3	4	1	1
9	1	10	64	81	1
7	6	5	1	1	4
8	9	7	1	4	1
N = 10	N = 10	N = 10	$\Sigma d_1^2 = 200$	$\Sigma d_2^2 = 214$	$\Sigma d_3^2 = 60$

Rank correlation between the judgement of 1st and 2nd judges :

$$r = 1 - \frac{6\sum d_1^2}{N^3 - N} = 1 - \frac{6 \times 200}{10^3 - 10} = 1 - 1200 = 0.212$$

Here we have directly calculated  $d^2$  because  $d$ 's are not required in applying the formula

Rank correlation between the judgements of 2nd and 3rd judges :

$$\frac{P}{(2 \text{ and } 3)} = 1 - \frac{6\sum d^2}{R^3 - N} = 1 - \frac{6 \times 214}{10^3 - 10} = 1 - 1.297 = 0.297$$

Rank correlation between judgements of 1st and 3rd judges :

$$\frac{P}{(1 \text{ and } 3)} = 1 - \frac{6\sum d^2}{N^3 - N} = 1 - \frac{6 \times 60}{10^3 - 10} = 1 - \frac{360}{990} = 0.636$$

Since coefficient of correlation is maximum in the judgements of the first and third judges, we conclude that they have the nearest approach to common tastes in beauty.

### Exercises :

1. What is the meaning of the term correlation ?
2. Describe positive, negative and zero correlation with the help of examples.
3. Calculate Pearson's Product Moment Correlation from the following set of scores.

X	10, 8, 6, 4, 2
Y	11, 7, 2, 6, 4

4. Find rank difference correlation from the following scores.

Eng	55	8	51	53	48	49	52	59	60	54
Math	61	47	39	38	36	43	49	50	41	41

### Suggested Readings :

1. Gakhar, S. C. (2009). Statistics in Education and Psychology. N. M. Publication Panipat.
2. Garrett, H. E. (1990). Statistics in Psychology and Education, Published by G. U. Mehta for Vakils Feffer and Simons Pvt. Ltd., Bombay.