



ALAGAPPA UNIVERSITY

[Accredited with 'A+' Grade by NAAC (CGPA:3.64) in the Third Cycle
and Graded as Category-I University by MHRD-UGC]

KARAIKUDI – 630 003

DIRECTORATE OF DISTANCE EDUCATION



M.Sc. [Psychology] 363 14

difficulty cognitive **emotions** developmental cases therapeutic systems self-direction generous mental wellness behavioural problems investigated anatomical distribution brain stimulation occurring factors insufficient patients perform sociological perspectives mind problem solving stages sensory psychological diagnosis resources illnesses continuum medication depression difficulty survey diagnosed characteristics severity gene therapy healthcare emotion medication disorder primary rigidity **psychological** personality advanced stages slowness biology environment treatment people different pathological clinical



PSYCHOLOGY PRACTICAL – I

I - Semester



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PSYCHOLOGY PRACTICAL - I

Authors

J.C. Aggarwal, *Former Deputy Director of Education (Retd), Delhi Administration, Delhi*

From: (1-8, 11-12)

Dr. Vasantha R Patri, *Director & Chairperson Indian Institute of Counselling, Delhi*

From: (9-10)

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• Website: www.vikaspublishing.com • Email: helpline@vikaspublishing.com

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PSYCHOLOGY PRACTICAL - I

Syllabi

Tests from the following areas will be selected by the University and conducted during the I semester of the course.

1. Attention
 2. Learning
 3. Memory
 4. Perception
 5. Intelligence
 6. Problem Solving
 7. Creativity
 8. Adjustment
 9. Attitude
 10. Prejudice
 11. Motivation
 12. Achievement Motivation
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INTRODUCTION

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Psychology is important as it is concerned with the scientific study of behavior and mental processes; at the same time, it is also applied to many different aspects of human life. Everything we do is related to psychology. Psychology primarily studies who and what we are, why we are like that, why we act and think in a particular manner and what we could be as a person. In other words, psychology is the combination of three important terms, viz., science, behaviour and mental process.

Attention, learning, memory, perception, intelligence, problem-solving, creativity, adjustment, attitude, prejudice, and motivation play an indispensable role in understanding psychology. This book, *Psychology Practical-I*, discusses all these concepts.

1. ATTENTION

Attention is the basic need for all successful teaching. It is the primary precondition for all types of our mental activity—cognitive (knowing), affective (feeling) and conative (acting). Attention is the heart of the conscious process. It is the concentration of consciousness of one object or idea rather than the other. Attention may be compared to the action of a photographic camera. Just as the camera is focused on a particular object or an individual or group leaving out others, in the same way attention is concentrated on a particular object. Other objects are left in the background either unconsciously or subconsciously.

Every single moment of a child is attracted by a large number of stimuli of the environment. His mind is not able to concentrate on all these at the same time. The objects which occupy the centre of consciousness are within the field of attention. Other objects which do not receive his attention are included in the field of inattention. It is on this account that attention has also been described as a selective process of the mind.

While we are conscious of every object we attend to, we do not attend to every object that we are conscious of. Consciousness, therefore, is a wider field and includes attention. We attend to a part in the field of consciousness, the rest is not attended to. While we are looking at a picture in the classroom, we are also conscious of a large number of other objects in the classroom. But the picture is the ‘focus’ of our consciousness. As the picture is the ‘spotlight’ of attention, other objects in the room—chairs, desks, etc. remain at the margin of consciousness. Thus, there are two fields: one of ‘attention’ and the other of ‘inattention’.

Attention is an attitude of mind. It denotes ‘preparedness’ or ‘readiness’ to do something. This was reflected in Woodworth’s citing of military command ‘Attention’ and the athletic call ‘Ready’.

According to F H Bradley, attention is a complex of sensation and ideas.

While Wunck laid stress on the cognitive aspect of attention, Maudsley, Ribot and Munsterberg emphasized the conative aspect of attention. Titchener stressed on the affective aspect of attention.

On account of the complex character of attention, psychologists defined attention in a number of ways.

1. **According to EB Titchener** (1867–1927), “The problem of attention centres in the fact of sensible clearness.”
2. **McDougall** (1920) observed, “Attention is merely conation or striving, considered from the point of view of its effect on cognitive process.”
3. **B Dumville** (1938) was of the view, “Attention is the concentration of consciousness upon one object rather than upon another.”
4. **JB Morgan and AR Gilliland** (1942) defined, “Attention is being keenly alive to some specific factor in our environment. It is a preparatory adjustment for response.”

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5. According to **IW Stout** (1953): “Attention is conation determining cognition. The stronger the conation, the more intense is the attention.”
6. **JS Ross** (1954) said, “Attention is a process of getting an object of thought clearly before the mind.”

Chief Characteristics of Attention

From the definitions and meaning as given above, chief characteristics of attention may be noted as the following:

1. Attention is a form of activity of the mind.
2. Attention is cognitive, affective and conative.
3. Attention is selective.
4. Attention has a narrow range.
5. Attention is increase of clearness of the stimulus.
6. Attention is a state of consciousness.
7. Attention is mobile and moves from one object or idea to another.
8. Attention is attracted by new things.
9. Attention makes clear and vivid the objects which we attend to.
10. Attention arouses interest in an individual to focus concentration on a particular object to the exclusion of others.
11. Attention can be developed and promoted.
12. Attention affects motor adjustments such as postural adjustment (how to sit, stand, etc.), muscular adjustment and adjustment in the central nervous system.

Types of Attention

Attention has been classified in a number of ways. The two ways in which attention is usually classified are the following:

- **Involuntary Attention or Non-Volitional:** This kind of attention is spontaneous and does not involve any effort on the part of the individual. The object automatically calls for our attention. Some examples of involuntary attention are: loud music in a neighbour’s house when one is reading a book; sudden noise such as a pistol shot, an accident, etc.
- **Voluntary Attention or Volitional:** In voluntary attention, there is a conscious effort by an individual. .When a child tries to understand a difficult passage with mental strain, his attention is voluntary. In the examination hall, a student concentrates on the answer to a question and keeps away his mind from the distracting elements like the movements of the supervisors, etc.

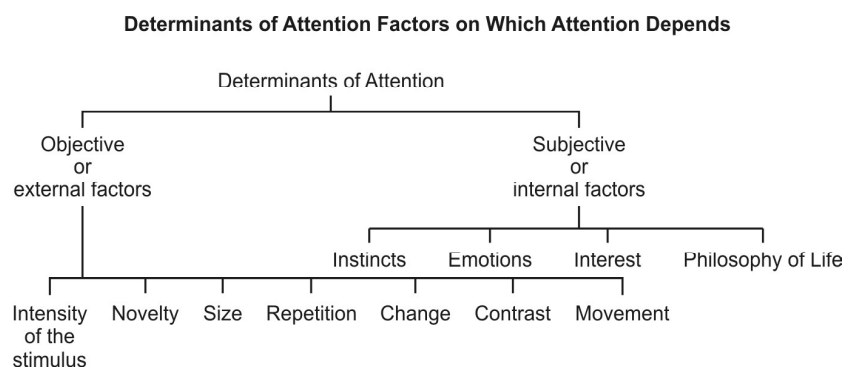
- **Non-Volitional Enforced Attention:** This type of attention lasts as long as there is stimulus. It is sustained because it appeals to an individual's instinct or instincts. This type of attention is very common in small children. A child's curiosity is aroused to attract his attention.
- **Spontaneous Non-Volitional Attention:** This type of attention develops on account of real interest in the object itself. The teacher has just to develop desirable sentiments for things in children. Once this is done, children will automatically attend to things around which sentiments have been formed.
- **Implicit Volitional Attention:** This type of attention is obtained by introducing motives such as rewards or punishments.
- **Explicit Volitional Attention:** Repeated efforts are made to obtain this type of attention. For example, while preparing for an examination, a student makes repeated efforts to read his notes or books.
- **Habitual Attention:** During the course of our experience with several things, we are conditioned to attend to certain stimuli. Here external conditions are not involved. A mother always hears the cries of the baby whereas others may ignore it. Usually, we are habituated to see beautiful objects. A naturalist is habituated to look for plants.

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Educational Implications of Attention

Attention is a necessary condition for any mental task in the classroom. In fact, it is the 'hub' of the entire teaching-learning process. Attention provides a mental state of preparedness or state of alertness for a task to the learner as well as to the teacher. Attention enables the learner to sense or perceive selected events, conditions or ideas of a task. 'Learning to pay' attention is an important part of observational training. The learner must acquire the habit of placing himself in a state of readiness to perceive the specific aspect of phenomenon that relates to the topic and ignore other factors. He must learn to concentrate. A teacher has to do his best to make students learn to secure attention. At the same time, he has to create such conditions in the classroom which enable him to make students attentive to learning.

Attention increases efficiency and is helpful in remembering. It arouses interest and motivates a child to study.



Securing Students' Attention

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As attention plays a significant role in the teaching-learning process. While it helps teachers to teach well, it also helps students to learn well. Energies of teachers and students are optimally utilized when they are both absorbed in the teaching-learning process. Thus, 'attention is the key' for any desired achievement. However, a major responsibility rests upon teachers who should keep in mind the various external and internal factors which help to focus attention.

External Factors

1. *Intensity of Stimulus*: Other things being equal, a strong stimulus attracts the attention of students. A teacher with a modulated voice (neither too loud, nor too low; neither high pitched nor low pitched, etc.), is able to attract the attention of his students.
2. *Novelty*: The teacher should attempt to bring in new ideas, experiments, audio-visual aids to secure the attention of students and to make his teaching interesting.
3. *Size of the Object*: In the case of visible objects, a reasonably big size has an advantage over a small size. Thus, a teacher should make blackboard sketches and his writing legible. Similarly, the print and type of the textbook should be large and clear so as to enable students to read with ease.
4. *Repetition*: If stimulus is repeated, it is likely to sustain attention. The teacher should repeat the salient points of a lesson in order to bring it home to the students.
5. *Change*: Change in gestures, movements, voice and in treatment of the subject-matter is very helpful in attracting the attention of students.
6. *Similarity and Contrast*: Similarities and contrasts between ideas and objects easily catch the attention of students.
7. *Movements*: Pictures depicting motions are very helpful in attracting attention. Teachers' movements in the class should be rational and orderly. Their sitting and standing postures, as well as their explanation and writing on the blackboard have a great influence on the attention of students.
8. *Organization*: The subject matter to be taught should be properly organized into units. Overall arrangements in the class should be orderly and systematic.

Internal Factors

1. *Sublimation of Instincts*: There should be lot of material to cater to the instinctive needs of students.
2. *Interest*: Attention and interests are closely interrelated. It is common knowledge that children attend to those things which are of interest to them. The teacher is, therefore, called upon to know the interests of students and then plan his programme accordingly.

3. Emotion

4. *Philosophy of Life*

Distraction

Meaning of Distraction: In the words of Woodworth, “Distraction is any stimulus that does not fit in with the line of thought or purpose of the moment. It is a stimulus that attracts attention away from the things to which we want to attend.” A student may be attending a class but a procession on the street is a distraction as it takes away his attention. The loud noise of the fan is a distraction too.

Causes of Distraction: The stimulus causing distraction has certain factors of advantage over the object which is the focus of attention. The intensity of those factors is higher than the object of attention. In the classroom, the most important causes of distraction are: (i) Noise, (ii) Unfavourable or extreme temperature, (iii) Improper lighting arrangements, (iv) Uncomfortable seating arrangements, (v) Unimaginative methods of teaching, (vi) Bad health, and (vii) Anxieties and worries.

Harmful Effects of Distraction

- (a) *On Teachers:* Distraction reduces the efficiency of the teachers and leads to wastage of his energy and time. Repetition by the teacher often makes him irritable
- (b) *On Students:* Distraction results in discontinuity of the learning process. As there is disturbance in the thinking process, students are often absent-minded. There is also a loss of self-control and irritation in students.

Overcoming Distraction

Distraction can be overcome by the creation of a favourable environment. Distracting elements should be removed before the start of the lesson. The teacher should also speak aloud and use dynamic methods including aids.

2. LEARNING

Learning occupies an important place in the school programme. In fact, schools are set up for making children learn. All efforts of teachers and parents are devoted to help children learn. Learning is an enriching experience as there is an interaction with the environment. Without learning, all efforts of children as well as of teachers have little meaning. It is generally observed that in the determination of a child’s behaviour, there is no process more important than learning. However, psychologists differ on the concept of learning. Several attempts have been made to define learning. The following definitions give a comprehensive view of learning.

1. **According to R S Woodworth (1945),** “Any activity can be called learning so far as it develops the individual (in any respect, good or bad) and makes his behaviour and experiences different from what that would otherwise have been.”

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2. **H L Kingsley and R Garry**, (1946) said, “Learning is the process by which behaviour (in the broader sense) originates or changes through practice and training.”
3. **Gates and Others** (1946) observed, “Learning is the modification in behaviour to meet environmental requirements.”
4. **F S Freeman** (1958) defined, Learning is the process of developing the ability to respond adequately to a situation which may or may not have been properly encountered.”
5. **B L Hilgard** (1958) was of the view, “Learning is the process by which an activity originates or is changed through reacting to an encountered situation, provided that the characteristics of the change in activity cannot be explained on the basis of native responses, tendencies, maturation or temporary states of the organism (e.g., fatigue or drugs, etc.)”
6. **H Faigan** (1958) believed, “Learning is a sequence of mental events or conditions leading to changes in the learner. As a sequence of events, the learning process is as follows:
 - (i) The individual has needs and is therefore in a state of readiness to respond. These are antecedent conditions within the learner.
 - (ii) He meets a learning situation or problem. A new interpretation is required because previously learned responses are not adequate for reaching the goal and satisfying his need. He encounters something new or unexpected, and must search for a different response.
 - (iii) He interprets the situation with reference to his goals, and tries a response or responses which seem to satisfy his need. The way he perceives the situation and the response he makes depends both on his ‘readiness’ and on the external conditions of the situation.
 - (iv) If his response leads to devised goals or satisfaction, he will tend to interpret and respond to similar future situations in the same way. If not, he keeps on trying and reinterpreting until consequences are attained. The learning process is this whole sequence!”
7. **H J Klausmeir** (1961) said, “Learning is a process whereby a change in behaviour results from some form of experience, activity, training, observation and the like.”
8. **H P Smith** (1962) observed, “Learning is the acquisition of new behaviour or the strengthening or weakening of old behaviour as the result of experience.”
9. According to **E A Peel** (1962), “Learning is a change in the individual following upon changes in the environment.”
10. **Hunter and Hilgard** (1964) said, “Learning is the process by which an organism in satisfying its motivations, adopts and adjusts its behaviour, in order to overcome obstacles or barriers.”

11. **Blair, Jones and Simpson** (1964) defined “Any change of behaviour which is a result of experience, and which causes people to face later situations differently may be called learning.”
12. **Pressey, Robinson and Horrocks** (1967) wrote, “Learning is an episode in which a motivated individual attempts to adapt his behaviour to succeed in a situation which he perceives as requiring action to attain a goal.”
13. **W C Morse and G M Wingo** (1968) observed, “Learning can be defined as changing one’s potential for seeing, feeling, and doing through experiences partly perceptual, partly intellectual, partly emotional and partly motor.”
14. According to **J F Travers** (1972), “Learning is a process that results in the modification of behaviour.”
15. **Crow and Crow** (1973) said, “Learning is the acquisition of habits, knowledge and attitudes. It involves new ways of doing things, and it operates in an individual’s attempts to overcome obstacles or to readjust to new situations. It represents progressive change in behaviour. It enables him to satisfy interests to attain goals.”
16. **C V Good** in *Dictionary of Education* (1973), explained the term ‘learning’ as a “Change in response or behaviour (such as innovation, elimination or modification of responses, involving some degree of performance) caused partly or wholly by experience, such experience being in the main conscious, but sometimes including significant unconscious components, as is common in motor learning or in reaction to unrecognized or subliminal stimuli; includes behaviour changes in the emotional sphere, but more commonly refers to the acquisition of symbolic knowledge or motor skills, does not include psychological changes, such as fatigue or temporary sensory resistance or non-functioning after continued stimulations.”
17. **M L Bigge** (1976) observed, “Learning may be considered as a change in insights, behaviour, perception, motivation or a combination of these.”
18. **Bernhardt** in *Practical Psychology* wrote, “Learning is more or less permanent modification of an individual activity in a given situation, due to the practice in attempts to achieve some goal or solve some problem. ”
19. **According** to Colvin,—”Learning is the modification of the reactions of an organism through experience.”
20. **Cronbach** defined learning to be a change in behaviour as a result of experience.”
21. **Eason** viewed, “Learning includes changes in behaviour that are determined primarily by the individual’s interaction with his environment.”
22. **Gooch** said, “Learning, as we measure it, is a change in performance which occurs under the condition of practice.”

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23. Harrimn defined, “Learning is the improvement in efficiency of adjustment as a result of practice, insight, observation, imitation and conditioning.”

24. Heidgerken explained, “Learning is not an addition of new experience *per se*, nor is it an old experience summed up, rather it is the synthesis of old and the new experiences which result in completely new organization or pattern of experience.”

25. According to **Kimble**, “Learning is a relatively permanent change in behavioural potentiality that occurs as a result of a reinforced practice.”

26. MH Marx observed, “Learning is a relatively enduring change in behaviour which is a function of prior behaviour (usually called practice).”

Key Phrases used in the Definitions of Learning

An analysis of the above mentioned definitions would reveal the following key words and phrases in learning:

- (i) Modification of behaviour,
- (ii) Practice for behaviour,
- (iii) Training for behaviour,
- (iv) Changes in environment,
- (v) Motivated individual, i.e., the learner,
- (vi) Attainment of a goal,
- (vii) Acquisition of habits, knowledge and attitudes,
- (viii) New ways of doing things,
- (ix) Overcoming obstacles,
- (x) Readjusting to new situation.
- (xi) Ability to respond,
- (xii) Satisfaction of needs through encountering something new,
- (xiii) Trying and reinterpreting the situation for the satisfaction of needs,
- (xiv) Acquisition of new behaviour,
- (xv) Strengthening of old behaviour,
- (xvi) Weakening of old behaviour,
- (xvii) Satisfaction of motivations by adopting and adjusting behaviour,
- (xviii) Overcoming obstacles,
- (xix) Changes in the individual through changes in the environment,
- (xx) Adopting behaviour to the situation,
- (xxi) Permanent modifications in the behaviour,
- (xxii) Changes in behaviour as a result of reinforcement,

- (xxiii) Changes occurring in behaviour through practice,
- (xxiv) Improvement in the efficiency of adjustment through practice,
- (xxv) Learning as the synthesis of old and new experiences.

It may be stated that learning should enable us to make the best use of the things around us. If a man has not learnt the art of living harmoniously with others, he would be beset with difficulties than the person who has learnt to establish social relations with his fellows. So the acquisition of abilities, which enable us to adjust ourselves in an effective manner in an environment and to control it successfully, is said to be the aim of learning.

Main Characteristics of Learning

Yoakman and Simpson enumerated nine general characteristics of learning as the following:

- (i) **Learning is Growth:** The word growth is generally associated not only with the body which is growing physically, but with the mental growth of an individual. Through his daily activities, a child grows both mentally and physically. Therefore, we say that learning is growth through experience.
- (ii) **Learning is Adjustment:** Learning helps the individual to adjust himself adequately to new situations. Children come across new situations which demand effective solutions. Life is full of experiences, and each experience leaves behind some effects in the mind, which in turn, modify our behaviour.
- (iii) **Learning is Experience:** Learning is not mere addition to knowledge and acquisition of facts and skills through drill and repetition. It is the reorganization of experience.
- (iv) **Learning is Purposeful:** True learning is based on purpose. Purpose plays a big role in learning. According to Ryburn, "This purpose is always connected with the use of some instinctive power, with the use of the energy with which we are endowed with birth." We do not learn anything and everything that comes in our way, in a haphazard manner. All school activities should be purposeful so that a child feels the real urge for learning.
- (v) **Learning is Intelligence:** Meaningless efforts do not produce permanent result as work done mechanically is without any soul. When a child learns something unintelligently, he is likely to forget it soon. He does not assimilate but simply memorizes. Only efforts made intelligently have lasting effects.
- (vi) **Learning is Activity:** Learning does not take place without a purpose and self-activity. In the teaching-learning process, the activity of the learner counts more than the activity of the teacher. This is the main principle of learning and it has been recommended by all modern educationists. In fact, all progressive methods of education such as the Dalton, the Project, the Montessori and the Basic are based on this.

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(vii) Learning is Both Individual and Social: Learning is more than an individual activity, it is a social activity too. An individual's mind is affected by the group mind consciously as well as unconsciously, as he is influenced by his friends, relatives, classmates, parents, etc., and learns their ideas, feelings and notions. Social agencies like the family, church, playmates, social networking including media, have a tremendous influence on a child's mind.

(viii) Learning is the Product of the Environment: Environment plays an important role in the growth and development of an individual. A conducive healthy and educative environment should be provided for effective learning.

(ix) True Learning Affects the Conduct of the Learner: There is a change in the mental structure of the learner after every experience.

When and Where Learning Takes Place

Learning is not limited to school only; it begins long before and may continue long after school days. Thus the ability to speak one's mother tongue begins in early infancy. On the other hand, the ability to practise a profession, such as that of a doctor, is acquired after leaving the medical college. Similarly, one learns the art of walking before one goes to school. The behaviour towards the one's family is learnt at home, but to behave as a member of society, is learnt in school.

Goals of Learning

Goals of learning can be classified in three broad categories: (i) Acquisition of knowledge, (ii) Acquisition of skills, and (iii) Acquisition of attitudes and ideals.

(i) Acquisition of knowledge includes (a) Perception, (b) Conception, (c) Associative learning.

(a) Perception: Perception refers to the acquisition of specific knowledge about objects or events, directly stimulating the senses at any particular moment. An object comes before our sense organs. We get its sensation and attach meaning to it on the basis of our past experiences. This is called perception and the type of learning is known as perceptual learning. An infant sees a woman. In the past, the woman had fed him. On the basis of that experience, he comprehends that the woman is his nurse or mother.

(b) Conception: Conception means the acquisition of organized knowledge in the form of general ideas or concepts. Perception refers to an individual or specific situation and conception to general or universal situation. The child gets the perception of an apple, banana, orange, etc., and is able to locate certain general qualities in them. On the basis of these qualities, he forms a conception of fruits.

(c) Associative learning: Associative learning corresponds to memory, both as the deliberate recall and recognition, past experience and a habit or automatic memory due to association. Associative learning is fundamental to all other learning.

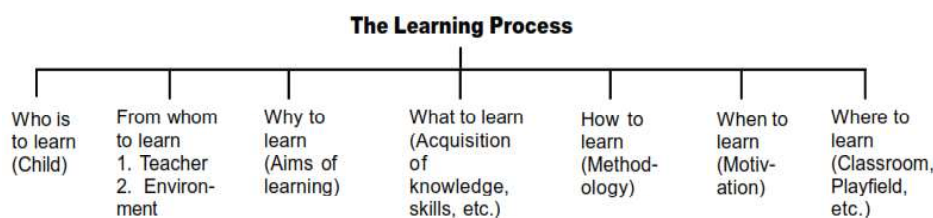
- (ii) **Acquisition of skills:** Under this, we include the sensory-motor processes—writing, reading, musical performance, language acquisition in its vocal aspect, art, drawing, handwork, etc.
- (iii) **Acquisition of attitudes and ideals:** This is present in the affective or feeling element. An ideal is a concept which is attached with some worthwhile value.

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Classroom Educational Implications of Learning

Educational implications of classroom learning may be summarized as under:

1. *Who is to learn?* The child is to learn and therefore, his age, abilities, aptitudes and interests may be taken note of by all those who are responsible for the child’s learning.
2. *From whom to learn?* Learning is from the teacher. Therefore, a teacher must present good models of teaching and learning.
3. *Why to learn ?* Learning is for individual good as well as for the good of the society.
4. *What to learn?* Learning is not merely in terms of the traditional ‘Three R’s,’ i.e., reading, writing and arithmetic but in terms of ‘Seven R’s,’ i.e., reading, writing, arithmetic, rights, responsibilities and their relationships and recreation.
5. *How to learn?* It involves various methods of learning, for instance, learning through rote memory, learning through imitation, learning through insight, etc.
6. *When to learn?* This is concerned with motivational situations for the learner.
7. *Where to learn?* Learning takes place in the classroom, on the playfield, in the workshop, in the neighbourhood, etc. School is not the only place of learning.



Learning Process: Learning is a sequence of mental events or conditions leading to changes in the learner. As a sequence of events, the learning process is as follows:

1. The individual has needs and is, therefore, in a state of readiness to respond.
2. He meets a learning situation or a problem. A new interpretation is required because previously learnt responses are not adequate for reaching the goal and satisfying his need. He encounters something new or unexpected, and must search for a different response.

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3. He interprets the situation with reference to his goals. He tries a response or responses, which seem to satisfy his need. The way he perceives the situation and the response he makes, depend both on his readiness, and on external conditions of the situation.
4. If his response leads to desired goals or satisfaction, he will tend to interpret and respond to similar future situations in the same way. If not, he keeps on trying and reinterpreting until consequences are attained. The learning process is the whole sequence.

From the above it is very clear that a teacher must acquire a sound knowledge of learning, its nature and its process, so as to make his teaching learning effective, efficient, motivational and inspirational. He should know well the operations and approaches to use proper strategies and if needed to evolve new strategies of teaching-learning.

Kinds and Types of Learning

Learning has been classified in a number of ways into various categories. It is very difficult to divide learning into clear cut categories because one category overlaps the other. Some of the important categories are the following:

1. Deliberate or conscious learning
2. Unconscious or concomitant learning
3. Development learning
4. General concept of learning
5. Hierarchical order of learning

1. Deliberate or conscious learning: This includes learning of a skill or subject, which can be of two types:

(i) *Primary learning:* This includes learning of facts, principles and theories, etc., which forms the main basis of lessons.

(ii) *Associated learning:* This consists of learning of facts and other objective materials because they are related to primary learning and are logically brought into the lesson.

2. Unconscious or concomitant learning: This includes learning of likes and dislikes, attitudes, etc. This type of learning is as important as conscious learning.

3. Development learning: Depending on the type of development, learning is classified as

- | | |
|------------------------------|--------------------------|
| (i) Academic learning, | (ii) Emotional learning, |
| (iii) Intellectual learning, | (iv) Moral learning, |
| (v) Motor learning, | (vi) Sensory learning, |
| (vii) Social learning. | |

4. General concept of learning: Knowledge and skills, Attitude and Value formation, etc., fall under the category of general concept of learning.

5. Hierarchical learning: R M Gagne (1970) classified learning into eight categories:

- (i) Signal learning, (ii) Stimulus-Response (S-R) learning, (iii) Chain learning, (iv) Verbal associate learning, (v) Discrimination, (vi) Learning of concepts, (vii) Learning of principles and (viii) Problem-solving.

(i) Signal learning: It is usually termed as classical conditioning which was developed by a Russian physiologist, Pavlov. In classical conditioning, unconditioned stimulus (food) and conditioned stimulus (sound of the bell) were paired together and presented to a dog a number of times. The with the result obtained was that when conditioned stimulus, i.e., CS (the sound of the bell) was presented alone, it elicited saliva from the mouth of the dog. This modification of behaviour which caused salivation to the sound of the bell, was called conditioning. (More details on this are given while discussing the theory of classical conditioning).

(ii) Stimulus-Response (S-R) learning: Thorndike initiated the study of instrumental conditioning with puzzle box experiments on cats. B F Skinner conducted a series of experiments on animals and prepared ground for the application of those principles in human learning (Discussed elsewhere in detail)

(iii) Chain learning: Chain learning consists of motor and verbal chaining. *Verbal chaining* is connecting together, in a sequence, two or more previously learnt stimulus responses (S's - R's), in which the first member or element of the sequence seems firmly tied with the second. Some examples are: a boy and a girl, daddy and mummy, horse and buggy, etc., among others. *Motor chaining* may be illustrated with the stimulus response connections in the process of unlocking a door: (a) Key in hand, (b) Facing the lock, (c) Checking the side of the key to be inserted, (d) Inserting the key into the lock until the end of the lock is reached, and finally, (e) Pushing the door to open it. However, it must be remembered that for establishing a chain, one must be capable of performing the individual links.

(iv) Verbal associate learning: Verbal associate learning can be explained by the following example: A child is shown an object, say a doll. The next time he sees this particular object, he will be able to say that it is a 'doll'. Thus, two chains are involved here:

(a) Observing responses (Ss-R) connection that connects the appearance of the object and distinguishes it from other objects, (b) Ss-R connection that stimulates the child himself to say 'doll'.

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S	⇒	R	S	⇒	R
Object		Observing	Doll		Doll

- (v) **Discrimination:** When a behaviour shows a specificity of response to one given stimulus to the exclusion of others, we may say that discrimination has taken place. From the very beginning, an infant learns to discriminate between a feeding bottle and a simple bottle, between walking and talking, etc. Gradually, the child learns to discriminate more objects and ideas. Discrimination involves higher mental processes. In discrimination, the emphasis is not on the stimulus side but on the response side and in differentiation.
- (vi) **Concept learning:** In concept learning, we deal with a set of objects as the stimuli. We form concepts by finding properties which a set of objects have/share in common. Thereafter, we learn generalizations within groups and gradually learn discrimination between them. First, we learn about a dog, then various breeds of dogs and then cats, etc.
- (vii) **Learning of principles:** Learning of principles depends on learning of concept formation and other forms of learning. Principles denote regular relationship among two or more concepts.
- (viii) **Problem-solving:** Problem-solving comes at the higher stage in the hierarchy of learning process. In fact, all the earlier steps lead to problem-solving.

Factors Affecting Learning

There are essentially four interrelated factors which affect learning. These are as follows:

- (a) Psyche of the student
- (b) School atmosphere
- (c) Home atmosphere
- (d) The socio-economic factor

(a) Psyche of the Student

The student is the subject who has to learn. It is the student's state of being which is most important to study. This state is affected by the student's will to learn, his or her ability or disability, if any, which assists or prevents learning, memory or power of retention, attention and capacity to recapitulate. These are traits of the child which affect learning. The barriers of language caused by numerous movements and migrations in today's volatile environment can have a significant adverse affect on learning if there are frequent changes in language or medium of instruction.

(b) School Atmosphere

The school includes the following three important contributors to the learning process.

- (i) Overall school environment
- (ii) The classroom environment
- (iii) The teacher

(i) Overall School Environment

Meaning of school ethos: School ethos implies moral nature or environment of the school, its guiding principles, its distinguishing character and its sentiment.

The concept of an ideal ethos for a school has been beautifully summed up by S Balakrishna Joshi, an eminent headmaster of a well managed school as, “A school is not a mere brick and mortar structure housing a miscellany of pupils and teachers; a school is not a market place where a heterogeneous crowd gathers with diverse objects; a school is not a rigorous reformatory where juvenile suspects are kept under vigilant watch. A school is a spiritual organism with a distinctive personality of its own; a school is a vibrant community centre, radiating life and energy all round; a school is a wonderful edifice, resting on the foundation of goodwill—goodwill of the public, goodwill of the parents; goodwill of the pupils. In a word, a well conducted school is a happy home, a sacred shrine, a social centre, a state in miniature and bewitching Vrindavan, all beautifully blended into a synthetic structure.”

It is not without reason that the Education Commission 1964–66 observed: “The destiny of India is now being shaped in its classrooms. On the quality and number of persons coming out of schools and colleges will depend our success in the great adventure of national reconstruction.”

Important factors in the appropriate school ethos for the many-sided development and learning of children

- (i) *Training in the art of living together:* “We do not visualize the school as merely a place of formal learning, whose main concern is to communicate a certain prescribed quantum of knowledge but rather as a living and organic community which is primarily interested in training its pupils in what we have called the gracious “art of living”, observed the Secondary Education Commission.
- (ii) *Development of a child’s entire personality:* We would like the school to see if it can provide a richly varied pattern of activities to cater to the development of its children’s entire personality. It has to formulate a scheme of hobbies, occupations and projects that will appeal to, and draw out, the powers of children of varying temperaments and aptitudes.

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(iii) *Provision of a stimulating environment:* The primary concern of the school should be to provide for its pupils a rich, pleasant and stimulating environment which will evoke their manifold interests and make life a matter of joyful experience.

(iv) *Transformation into activity school:* The school must be transformed into an “activity school” because activity has an irresistible appeal for every normal child and is his natural path to the goal of knowledge and culture.

We do not visualize that these schools will have dull, routine ridden formal lessons in the class *plus* a number of independent unrelated extra-curricular activities which have no intrinsic relationship with them either in contents or methods. The entire programme of the school will be visualized as a unity and inspired by a psychologically congenial and stimulating approach, the so-called ‘work’ being characterized by the feeling of joy and self expression usually associated with play and hobbies, and these having something of the meaningfulness and purpose which are normally considered a special feature of academic work. Thus, by planning a coherent programme of these different activities, rich in stimuli, the school will not be frittering away either the time or the energy of the pupils but will be heightening their intellectual powers also side by side while training them in other fine qualities.

(v) *Opportunities for self-discipline:* Discipline in the school will not be a matter of arbitrary rules and regulations enforced through the authority of the teachers helped by the lure of rewards or the fear of punishment. The students will be given full freedom to organize functions, to conduct many of the school activities through their own committees and even to deal with certain types of disciplinary cases. In this way, discipline will be maintained through the influence of the social group and it will gradually lead to the development of self-discipline.

No school can develop into an educative community, capable of releasing the students’ creative capacities, if the teachers maintain a stiff forbidding attitude towards their pupils and try to maintain their authority through various kinds of punishments whilst the pupils, on their part, stand in awe of them and are not prepared to share their problems and difficulties with them.

(vi) *The School as a centre of community service:* Another thing which will distinguish this school from most of the traditional schools *is* that it will be organized as a community.

(vii) *Providing work experience and socially useful work:* We expect the school to devote special attention to craft and other productive work and thus redress the balance between theoretical and practical studies which have been upset for many, many years.

Every well-established and reasonably well-financed school will have workshops and craftrooms where students will learn to handle tools and to fashion different kinds of material into form.

- (viii) *Comprehensive curriculum*: The school curriculum should fulfil the psychological and social needs of the students.
- (ix) *Guidance and counselling services*: These should be adequate.
- (x) *Human relations*. Students should be made acquainted with the principles of developing good, harmonious relations.
- (xi) *Dynamic teacher's personality* (see the next point).

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(ii) The Class Environment

Meaning of Classroom Climate: Classroom climate implies classroom environment in which change of behaviour or learning takes place through interaction in the group which consists of students of various shades and the teacher who is the leader of the group. The mental health of the group is an important factor in the process of learning. As a leader, the teacher is expected to create a democratic environment. His democratic behaviour in the classroom can steer constructive and inspirational individuals as well as group activities in the right direction. See Table 1.

General Suggestions for Creating Democratic Climate: Apart from the above mentioned factors for creating a democratic classroom climate, following suggestions should prove very useful:

1. It would be desirable for a teacher to throw some light on the qualities of leadership so that students choose their leaders wisely and the teacher is able to influence the class through its leaders. However, it must be stressed that a teacher must remain neutral in the selection of leaders.
2. The behaviour of the leader of the group is imitated by the members of the group.
3. Suggestion plays a big role in influencing the group behaviour. The suggestions put forward by the leader of the group are readily accepted.
4. The recent studies have made it clear that for bringing about changes in the individual, we must bring about changes in the characteristics of the group. The teachers, therefore, should adopt appropriate group methods in the class and through these influence the attitudes of the members of the group. Group training is better than individual training.

(iii) The Teacher

Teacher's Personality and Practices

Teacher's Personality: It has been rightly observed. "While books can teach, only personality can educate." A good personality includes:

- (a) Impressive Appearance
- (b) Modulated Voice
- (c) High Character

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Table 1 : Two Kinds of Classroom Environment

<i>Democratic Classroom Climate</i>	<i>Autocratic Classroom Climate</i>
1. Students are teacher-guided.	1. Students are teacher-dominated.
2. Students are guided by the teacher in the choice of many activities.	2. The teacher plans activities without conferring with the pupils.
3. The group suggests and proposes supplementary work—all of which is reviewed and appraised by the group.	3. All the supplementary work is chosen and assigned by the teacher.
4. Students aid in planning the academic work, make suggestions and proposals.	4. Students answer questions asked by the teacher.
5. Pupils share their ideas with the teacher in establishing standards of achievement.	5. Teacher sets up standards of achievement without conferring with pupils.
6. The students share with the teacher the responsibility of appraising their work.	6. The students are not conferred with in appraising their growth.
7. Students are encouraged by the teacher to make suggestions concerning their work.	7. The teacher ignores suggestions of the pupils.
8. The students can move about the room with comparative ease without disturbing the work.	8. The students can move only with the permission of the teacher.
9. Students are encouraged to correct their mistakes.	9. The teacher directs pupil activities.
10. The daily programme is elastic and can be changed as the group decides.	10. The teacher decides when pupils are to stop working on one subject and when to start on the next. The daily programme is rigid.

(Table cont.)

<i>Democratic Classroom Climate</i>	<i>Autocratic Classroom Climate</i>
11. The teacher adopts an exploratory attitude.	11. The teacher issues directives in a dictatorial manner.
12. The teacher tries to understand the child.	12. The teacher works according to pre-set procedures.
13. The teacher is sympathetic.	13. The teacher inspires awe and fear.
14. The teacher tries to find reasons for misbehaviour.	14. The teacher arbitrarily punishes pupils for misbehaviour.
15. Teacher takes into consideration individual differences of the students.	15. The teacher treats all children alike.
16. Children are naturally affectionate and are encouraged to show affection.	16. Teacher is cold towards a child's affection and does not reciprocate.
17. Every child is provided with opportunity to contribute and lead a group.	17. Only the aggressive and brighter children contribute and lead.
18. Materials and books are provided for all mental levels in a grade.	18. One level of supplies is furnished for single grade no matter what the ability range.
19. Students are grouped properly.	19. Students are grouped on administrative reasons.
20. The students express themselves freely.	20. There is no such freedom of expression.
21. Curriculum is flexible to meet with the needs of each child.	21. Curriculum is definite and same goals are set for all the children.
22. Teachers co-operate with other teachers to study problem students.	22. Teacher normally does not participate in group study of problem pupils.
23. Teachers encourage parents to visit school for a closer relationship between home and school.	23. Teachers discourage parents from visiting the school because, according to them, it disrupts the schedule.
24. School atmosphere is reflected by student's remark, "I like school."	24. School atmosphere is reflected by student's remark "I don't like school."
25. Students' committees assume responsibility for selecting equipment and supplies needed.	25. Teacher or the principal assumes responsibility for selecting and purchasing supplies and equipment

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(d) Effective Power of Communication.

Gandhi observed, “Woe to the teacher who teaches one thing with the lips and carries another in the heart.”

(2) *Effective interpersonal communication*: Good teaching is interpersonal communication. Teaching is a two-way communication. As the name indicates, interpersonal communication is the presence of the facility to seek reactions, information, etc. One way communication, i.e., telling or lecturing by the teacher, denies the facility to the learners to seek clarification, confirmation, etc. The learners do not get the opportunity to develop interpersonal relationships. Interpersonal communication has a built-in system of feedback. It ensures that further information and clarification are provided wherever possible. The receiver or the learner gets an opportunity to understand the message or the content of the communication.

Healthy interpersonal communication is the sound basis of sound instruction or teaching.

(3) *Ego-involvement*: The personality of the child should be given due recognition. Emerson has observed, “The secret of education lies in respecting the pupil.”

(4) *Constructive and creative discipline*: The teacher should have a sympathetic but firm attitude towards his charges.

(5) *Learning combined with creative Humour and Appropriate Laughter*: An experienced teacher once observed. “I consider a day’s teaching–learning wasted, if we do not have a hearty laugh.”

(6) *Teacher as a guide*: Sri Aurobindo writes in the regard, “The first principle of true teaching is that nothing can be taught. The teacher is not an instructor or a taskmaster, he is a helper and a guide. His business is to suggest and not to impose. He does not impart knowledge to the pupil: he shows him how to acquire knowledge for himself.”

(c) The Home Environment

The environment at home is the next important factor which affects learning. Stressed or disturbed atmosphere, family discords family feuds, and similar tension-inducing situations at the home have a serious negative impact on the learning process as they cause anxiety, divert attention, dilute focus and disrupt learning. The education level of parents, the time and energy they devote towards the child and the assistance they provide has a direct effect on the learning process. The Home, and the neighbourhood where the child spends the after-school hours, can have both a positive and the negative affect on learning. A healthy atmosphere around the home, the general health pattern within the home, sickness and disease—all such things can affect concentration and, ultimately, learning.

(d) The Socio-Economic Factor

This is another factor which comes into play in the modern world which impacts learning. Students come from various backgrounds. Some are poor while others come from affluent households. Students from affluent backgrounds will most likely have more educational support and resources to help them through school and college. Often, these neighborhoods have more tutoring support, after-school activities, and bookshops than middle class or poor neighborhoods. The availability of new technology affects faster access to knowledge and resources and thus has an impact on learning. Therefore, economic status and environment makes a lot of difference to the overall learning process.

Phases of Learning

Figure 1 shows the processes or different phases of learning. Obviously the learning sequence depends upon what is initially attended to by the learner. All signals could not be received. Our perception is selective, dependent on motivation, on prior knowledge and on features of the external stimuli, like intensity and suddenness. The first process illustrates one act of learning. The second adds the phase of transfer and reinforcement which link up bits of learning into systems. All these processes can happen naturally.

According to Gagne, three aspects of teaching can benefit from such knowledge: first, the planning of courses, curricula and lessons; second, the conduct of instruction; and third the assessment of what has been learnt. Gagne observed, "When teachers verify their activities against the standards of learning theory, they are accomplishing two highly desirable things. First, they are avoiding the grossly inappropriate actions which although seemingly desirable on other grounds, nevertheless, fail to promote learning in students. And second, they are adopting and maintaining attitudes which support learning as the central purpose of their activities. In the face of many potential distractions in the practice of teaching, the teacher keeps student's learning as a primary focus of concern."

Learning and Maturation

Learning and maturation are closely interrelated and interdependent on each other. Sometimes, it becomes difficult to determine as to which of the behavioural change is the result of learning and which one is the consequence of maturation. A Weismann (1889) was one of the pioneers to suggest the concept of maturation. According to him, the germ plasm is the carrier of heredity and is passed from generation to generation. Later, A Gesell (1930), popularized this term. According to him, "Growth is a process so intricate and so sensitive that there must be powerful stabilizing factors, intrinsic rather than extrinsic, which preserve the balance of the total pattern and the direction of the growth trend. Maturation is in a sense a name for this regulatory mechanism."

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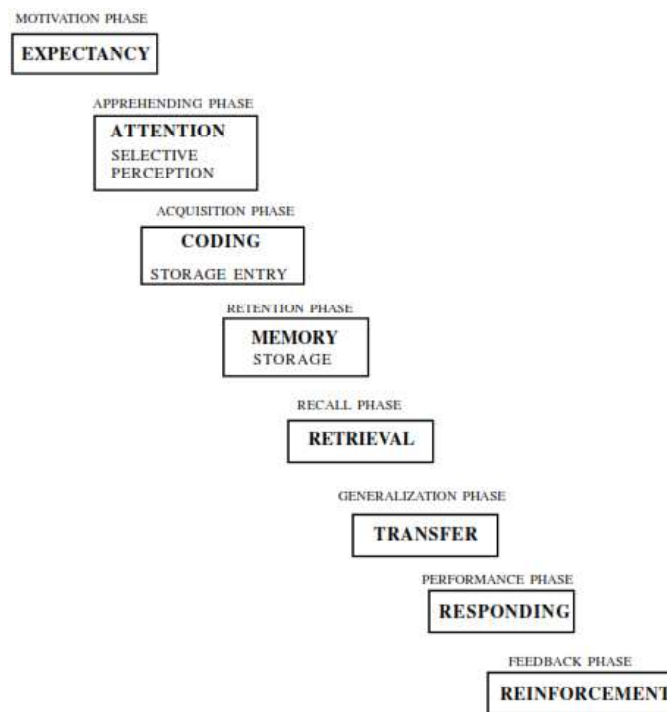


Fig. 1: Phases of Learning and the Process Associated with Them.

D C Marquis (1931) defined maturation in a more specific way. “Maturation is a modification of the organismic pattern in response to stimuli present in the inter-cellular and intra-cellular environments, which at the given moment are independent of external influences.”

At a later date, J A McGoeth (1942), defined the term maturation in terms of behavioural change. According to him, “Maturation includes any change with age in the conditions of learning which depends primarily upon organic growth factors rather than upon prior practice of experience.” Learning has been defined by McGoeth as, “A change in performance as a function of practice. In most cases, this change has a direction which satisfies the current motivating conditions of the individual.”

L Carmichael (1947) conducted extensive research on the problem of learning and maturation. He wrote, “Today, it is becoming more and more clear that during the whole period of growth and even during maturity, and again especially in the decline of capacity in old age, the behaviour of an organism can always be seen as resulting from the changes, structure and function.” He further observed that these changes were practically the result of inherited patterns and that some appeared to be somewhat independent of learning and environmental experience.

M L Biggie and M P Hunt (1968) observed write, “Maturation is a development process within which a person from time to time manifests different traits, the *blueprints* which have been carried in his cells from the time of conception.”

George G Thompson (1979) stated, “Maturation is a name for the growth process during which a structure or a function is more and more becoming adult, i.e., mature.” He further observed that these definitions stressed on different aspects of the maturation process, but were essentially similar in their emphasis on organically internal growth process, that were primarily independent of environmental factors external to the organism.

Thus, maturation involves changes that are associated with normal growth. It is relatively independent of activity, experience and practice. Learning, on the other hand, is a change in an individual, not on account of genetic inheritance, but because of changes in the behaviour in the learning process from activity, experience and training. It is a process which takes place as a result of ‘stimuli’ from ‘without’.

The behaviour is said to have matured if a behaviour sequence develops through regular stages, irrespective of intervening practices or training. If training procedures do not modify or speed up the behaviour, they are not important and the changes do not fall into the category of learning.

The swimming of tadpoles and the flying of birds can be attributed, primarily to maturation. But in the case of human beings, it is not easy to decide whether the activities result from maturation or learning. The most simple example is that of a child. The child learns to talk only when he reaches a certain stage or age. It is also equally true that he does not learn the language just because he attains that age. The language is taught to him. The language which he learns is that which he hears. Thus, it is very clear that the two processes, maturation and learning, are closely related to each other. Maturation helps in the process of learning. Learning can take place only if the stage for the particular type of learning has been laid through a process of maturation. A teacher would be effective if he understands the complexity of the changes that take place as a result of both these processes and the interaction between them. The reverse would be harmful. For instance, the normal development of speech in a child would be disrupted if he is forced to learn certain speech patterns before attaining a certain level of maturation. On the other hand, failure to provide specific training in speech at the appropriate time may be a great educational error.

Methods of Learning

Children learn in different ways. They learn by imitation, observation and practice. A child learns at home from all these ways. A student learns in school from his teachers, books, peers and by participating in various co-curricular activities. Important methods are the following:

(i) Observation, (ii) Trial and error, (iii) Self-study (Dalton), (iv) Generalization, (v) Problem solving, (vi) Discovery and experiment methods, and (vii) Project method.

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More Concepts in the Field of Learning

Limits of learning: Learning capacity of every child is limited. One cannot learn more than what his physiological capacity is.

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Role of practice in learning: A judicious use of practice strengthens learning.

Importance of incentives: Usually, use of rewards leads to better learning. Rewards may be in the form of verbal appreciation, cash or certificates, etc.

Position of insight: Insight learning is considered more effective than trial and error.

Transfer of training in learning: Learning is only effective if it can be transferred from one situation to another.

Learning and maturation: They both are interrelated and interdependent on each other.

Learning and forgetting: While we learn, we also forget.

Learning Curve

Learning curve is a graphic representation, drawn to represent the progress of learning of an individual or a group, in a given period. Usually, the abscissa (x -axis) of a learning curve is described in terms of number of trials or some measure of time. The ordinate (y -axis) is usually represented by scores (latency, frequency, etc.). The slope of the curve indicates the rate of progress (increase or decrease).

Two telegraphists, namely Bryan and Harter, were the originators of the learning curve. They came across this phenomenon while transmitting telegrams. If we take trials on x -axis and progress on y -axis, and join the points we have with us a learning curve (Fig. 2).

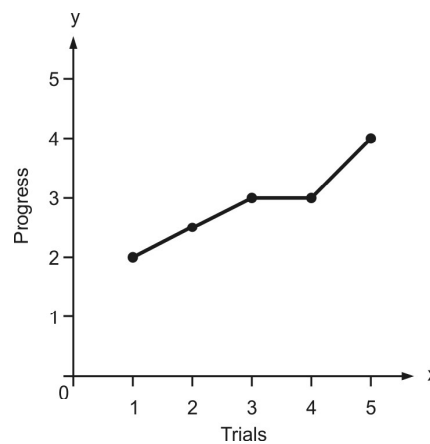


Fig. 2: Learning Curve

Learning curves connected with a child's learning are almost confined to the sensory-motor types of learning. They represent acquisition of skills such as telegraphy, typewriting, learning (memorization) and retention or forgetting of

practice material. Since such material is divisible into units and is capable of quantitative expression, the drawing of learning curves representing these skills is possible.

Types of Curves

The progress made in the acquisition of skills when graphically plotted takes the form of several types of curves.

1. **Straight Line Curve:** Such a curve shows a constant or uniform rate of progress in learning (Fig.3). However, this type of curve is seldom found. The progress or gain in learning in straight line curve is same in each successive trial.

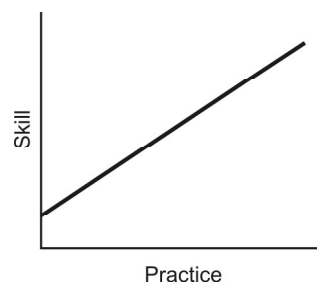


Fig. 3: Straight Line Curve

2. **Convex Learning Curve or Negative Accelerated Learning Curve:** In a convex learning curve, the rate of improvement or gain is fastest in the beginning but decreases gradually as practice continues. Such a rate of progress is called *negative acceleration* as improvement is still being made but the percentage or proportion of gain, decreases in successive trials. (Fig. 4). Such a curve is frequently found.

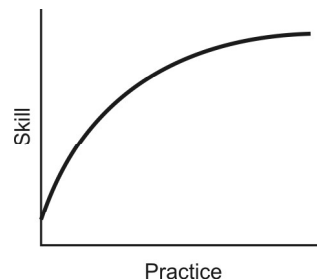


Fig. 4: Convex Learning Curve

3. **Concave Learning Curve or Positive Accelerated Curve:** This curve shows that the initial rate of gain gradually increases (Fig. 5). This increase in the rate of improvement is called *positive acceleration*. An example of positive acceleration is found in the increase of children's vocabulary. However, positive acceleration cannot continue indefinitely as sooner or later, one attains the highest stage of mastery.

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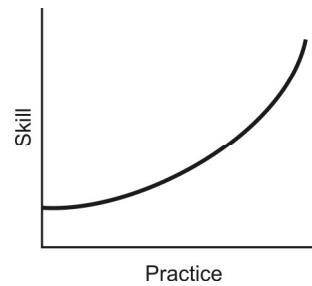


Fig. 5: Concave Learning Curve

4. Combination of Convex and Concave Curve: Such a curve represents both negative and positive acceleration (Fig. 6). On account of individual differences, these curves vary from person to person and from subject to subject. The form of the curve depends partly on the nature of the work and partly on the learner's ability to perform a task, his method of work, previous training and the circumstances under which he works.

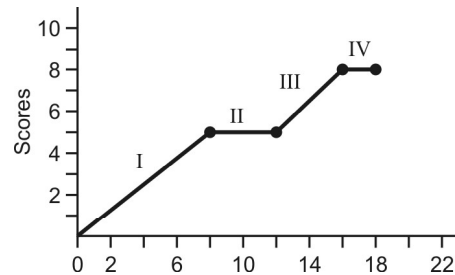


Fig. 6: Plateau in Learning

Stages in a Typical Learning Curve

A typical learning curve shows the following stages:

- 1. Initial level:** In the initial stage of a learning curve, the achievement of the learner is nearly zero in the first few trials and in some cases, the initial level may be absent.
- 2. Steep rise level:** In the second stage of a learning curve, there is a steep rise which indicates that the rate of improvement is substantial.
- 3. Intermediate level (Plateaus in learning):** During the period of learning, there may occur periods of no progress which are indicated by plateaus in learning.
- 4. Final level:** The final level of the learning curve shows that the learner has reached the limit of improvement. But incentives and improved teaching-learning techniques can also produce a rise.

Plateaus in Learning: It has been observed that at times, there are periods in learning when no progress is made. The periods of no progress are represented by plateaus in a learning curve. Often, it has been noticed that when learning at a

particular level is stretched, the scores of the learner remain almost the same through several trials. Practice is on but without any improvement in learning. Such lack of improvement in skill is denoted by *flat parts* of the curve. (Fig. 6). Plateaus are more likely to occur in complex tasks than in simple ones.

Plateaus are caused by several factors. Lack of interest or discouragement, loss of attention and motivation in the learner, complex or difficult subject matter or nature of the task, defective and uninspirational methods of teaching, developing bad habits such as holding of a pen or pencil in a wrong manner, pausing too frequently in reading a line, bad postures, unfavourable physiological factors like eye-trouble, fatigue, etc., are some of the factors responsible for the occurrence of plateaus. They are also caused by the complexity of a task and undue attention given to one aspect at the cost of another. In learning a language lesson, a learner may get a plateau if he stresses on *speed* and in the process, he loses *accuracy*.

Overcoming the State of Plateaus: A teacher must remember that plateaus can be avoided or their intensity lessened by a number of measures. Some of the important measures are discussed here.

A plateau which occurs because of lack of interest on the part of the learner, may be avoided by obtaining better coordination with the learner's interest or by providing him suitable incentives.

Plateau may appear when the subject matter becomes too difficult to be learnt by the learner. For example, a learner may start learning English. His progress may be satisfactory in the beginning but if the assignments are given to him in rapid successions, his progress may remain static. Such plateaus can be avoided by organizing the subject-matter suitably and by avoiding too difficult tasks in quick successions.

A plateau may also occur if the learner does not hold the pencil in the correct manner while learning to write. The remedy would be to teach the child to hold the pencil correctly. Plateaus occur if undue attention is given to one part of the task and others are neglected. A proper coordination of the task can avoid such plateaus.

Plateaus are formed when the learner is unable to understand a new method or a basic principle. For instance, while learning fractions in decimals, the learner would find it difficult to solve problems, unless the concept is made clear to him through concrete examples.

Plateaus may also occur on account of not conforming to the principles of hierarchical organization. Hierarchical organization may be illustrated with examples of mathematical operations ranging from simplest additions to most complicated mathematical calculations. Learners vary in level beyond which they cannot go. Such limitation would have to be accepted and learning plateaus should be treated as natural phenomena.

School time-tables should be planned out in such a manner that there is an even distribution of curricular and co-curricular programmes for students.

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This should be applicable for teachers also. Over-worked teachers fail to generate motivation in the learners leading to boredom and fatigue, etc.

Last but not the least, plateaus can also be avoided by a proper combination of *work* and *rest*.

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3. MEMORY

Memory increases our efficiency. Memory enables us to remember important facts, ideas, names, etc., and other items of information. Memory in fact, is one of the best friends, guides and philosophers of an individual. Without memory, an individual becomes inaccurate and inefficient. Memory is the function of the mind by virtue of which it records, retains and produces ideas gained by its own activity.

One of the important aims of school instruction is to encourage learners to acquire and retain the knowledge imparted in school for future use both in school life and in meeting out-of-school problems. of the present as well of the future. It is, therefore, essential to take proper steps so that students are able to retain and recall easily, the information acquired, even after a time gap.

Some of the definitions given below illustrate the various elements involved in memory.

1. **According to J A Adams (1967)**, memory is the learning capacity for responding and its persistence over time is measured by the retention test. Memory is the “state of a subject that gives the capability for correct occurrence of a criterion response. There is an initial acquisition session in which the subject makes a discriminative response to a stimulus, followed by a period of time called the retentional interval when the criterion response does not occur.”
2. **James Drever observed**, “Memory is that characteristic which underlines all learning, the essential feature of which is reflection. In a narrow sense, it covers recall and recognition.”
3. **Ryburn explained**, “the power that we have to store our experiences, and to bring them into the field of consciousness sometime after the experiences have occurred, is termed as memory.”
4. **Spearman was of the view**, “Cognitive events by their occurrence establish dispositions which facilitate their recurrence.”
5. **Stout defined memory as** “the ideal revival, so far as field revival is merely reproductive in which the objects of past experience are reinstated as far as possible in the order and manner of their original occurrence.”
6. **Woodworth and Marquis stated**, “Memory is a mental power which consists of learning, retaining and remembering what has previously been learnt.”

Memory is the reproduction of past experience even without the presence of stimulus. Memory may be explained as under:

Stimulus—response—acquiring of an experience—retention—time gap—recall.

According to Woodworth, four main elements of memory are: Learning (acquisition), retention, recall and recognition.

Learning: It is the process of establishing association of the ideas in mind.

Retention: It is the process of relegation of the past experience in the sub-conscious mind of the individual in the form of a mental experience.

Recall: It is bringing again in mind the past experience on the basis of *association of ideas*.

Recall is of two types: (i) Spontaneous and (ii) Deliberate.

In spontaneous recall, no effort is made to recall but the experiences or ideas just flow in. In deliberate recall, an effort is made to recall something.

Recall is dependent on association of ideas. This association of ideas is dependent on these laws: (i) Law of similarity (ii) Law of contrast (iii) Law of contiguity (iv) Law of regency (v) Law of frequency (vi) Law of primacy and (vii) Law of vividness.

Recognition: It is the capacity to recognize or express knowledge of all—seeing a thing that has been seen earlier.

Kinds of Memory

Memory may be categorized into five kinds: (i) Habit memory and true memory, (ii) Rote memory and logical memory, (iii) Passive memory and active memory, (iv) Personal and impersonal memory, and (v) Immediate memory and permanent memory.

(i) Habit Memory and True Memory: Bergson was of the view that habit memory is dependent upon mere motor mechanism while true memory depends on independent recollections. According to him, “The past survives under two distinct forms, firstly in motor mechanism, secondly in independent recollections. The memory of a lesson remembered in the sense of learned by heart has all the marks of habit, of the memory of each successive readings has none of the marks of habit. Of these two memories, one is pure or true memory, the other is habit interpreted by memory.” For example, learning of mathematical tables by mere repetition is a type of habit memory. True memory depends upon association and interest and therefore it is liked by educators.

(ii) Rote Memory and Logical Memory: Rote memory is the mechanical repetition of an experience without understanding. It is also termed as habit memory. Logical memory depends upon understanding.

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A child understanding the mathematical tables, repeating them a number of times and applying them on later occasions, is an example of logical memory.

(iii) Passive Memory and Active Memory: In passive memory, the past experiences come to our consciousness without making any effort on our part. In active memory, we make deliberate efforts to recall some forgotten experience.

(iv) Personal and Impersonal Memory: In personal memory, we remember our past experiences. In impersonal memory, facts are remembered without any reference to oneself.

(v) Immediate Memory and Permanent Memory: When the material learnt is recalled immediately after learning it, it is called immediate memory. On the other hand, when a certain amount of time has passed and then we try to recall it and succeed in recalling, it is called permanent memory.

Relationship Between Intelligence and Memory

Other things being equal (motivation, interest, etc.), the more intelligent the child, the better he usually does in his school work. A large number of research reports support this generalization. Bryan conducted a research that brought out some interesting light on the obtained relationship between memory and intelligence during childhood. Two hundred children between five and six years of age were given eleven tests of memory for various types of material, a vocabulary test, and the Stanford-Binet Test of Intelligence. Boys and girls were equally represented in the tests. A multiple factor analysis obtained from the scores of these tests revealed that the Stanford-Binet Test of Intelligence (one of the most efficient best and most widely used instruments) is closely interrelated with memory ability. No significant sex differences were found. On the basis of results, it was viewed that intelligence in young children, at least in so far as we are at present able to measure it, to a large extent, consists of retentive memory. The conclusion provided a reasonable explanation of the general finding that rote memory in children is much more highly related to general intelligence than it is in adults. Thus, memory indeed plays a significant role in the early adjustments of the child.

A Multistore Model of Memory

Several psychologists find it useful to distinguish at least three components of the memory system. Atkinson and Shiffrin divided the memory system into: (i) A sensory memory, (ii) short-term store, temporary working memory and (iii) A long-term store, permanent storehouse of information. Figure 7 explains event sequence of all types of learning.

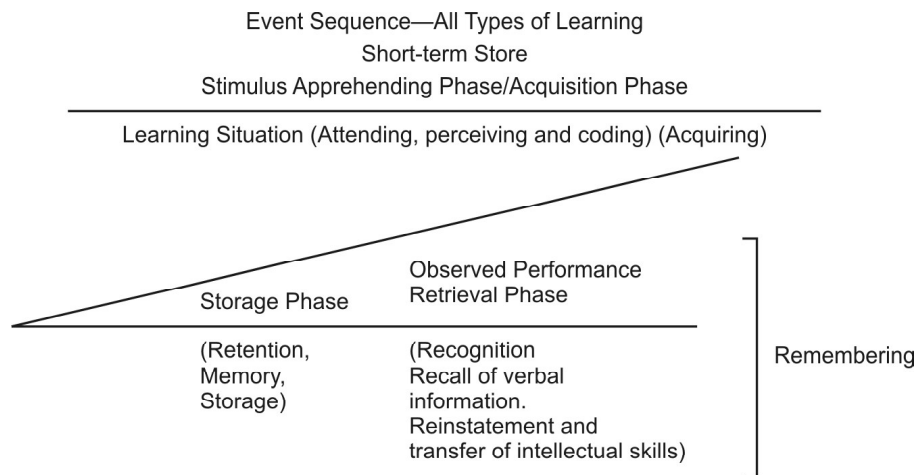


Fig. 7: The sequence of Events in Learning as Suggested by Gagne

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An Overview of the Memory System

- (i) **Sensory memory store:** Information from the environment arrives through the senses and is held briefly in a sensory store (the sensory register) of relatively large capacity. Some of this incoming information, once it is identified and categorized, can be passed along to the short-term store and then to the long-term store.
- (ii) **Short-term store:** It is assumed to be a temporary working memory with a limited capacity. In a sense, this is a record of the current contents of consciousness.
- (iii) **Long-term store:** It is conceived as a permanent repository of information. This memory store contains essentially, our knowledge of the world, and its capacity is immense. Once material has been transferred to long-term store, there seems to be little loss of information.

As material is acquired, it presumably passes through the sensory register and into the short-term store. Control process such as rehearsal, permits the transfer of this material to long-term, from which it may be subsequently retrieved. Actually, although not indicated in this diagram, long-term store enters the picture in a number of different ways. First, information from long-term store is necessary to permit pattern recognition and identification of raw sensory information held in the sensory register. Second, information that has been sufficiently rehearsed or organized is thought to be transferred to long-term store. Finally, the very control processes that are assumed to govern the movement of the information through the system must be represented in some way (as rules) in long-term store. Figure 8 presents an overview of the memory system.

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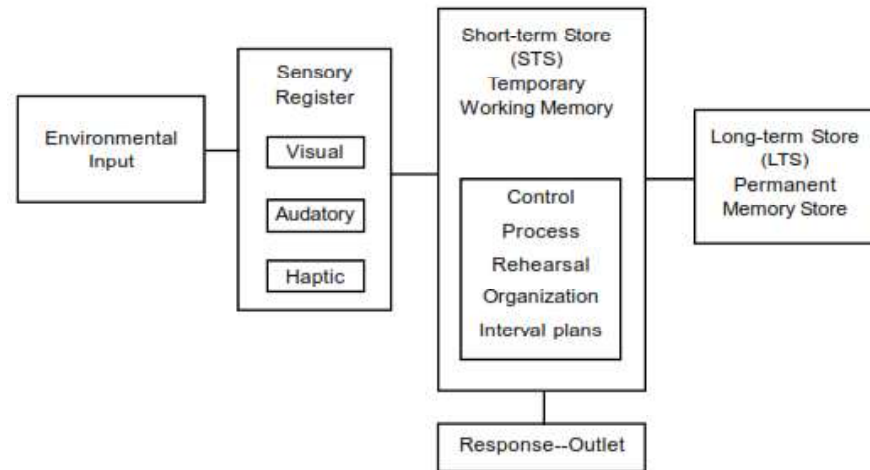


Fig. 8: An Overview of Memory System

Signs of Good Memory

Psychologists identify six signs of good memory.

- 1. Rapidity:** The first sign of good memory is rapidity, i.e., how quickly the learner recalls his experiences. How little time the learner takes in recalling his experience is denoted by rapidity.
- 2. Accuracy:** This implies the exactness with which a past experience is recalled. There could be rapidity in memory but accuracy might be missing. A good memory must possess the elements of rapidity and accuracy simultaneously.
- 3. Length of time:** This element denotes the time for which one can retain the past experiences and recalls them accurately. An individual might be able to retain and recall only a small quantity of the experience while another is able to retain and recall a large quantity. Thus, the latter would relatively have a good memory.
- 4. Quantity of experience:** Some people are able to recall whatever they learn while others recall only a little.
- 5. Promptness:** It implies the ease and spontaneity with which experiences are recalled.
- 6. Service ability:** It refers to the recall of right experiences at the right time, at the right place and in the right manner.

Measuring Memory or Retention

Hebbinghaus (1885) and others used four methods to measure retention. One of the common and simplest method is of **recall or reproduction**. For instance, a learner may learn a list of 40 words and after 8 hours is able to recall or reproduce only 20 words. Thus his recall store would be 20 out of 40 words or 50 per cent.

The second method to measure retention is the **relearning** or **saving method**. In this method, we first calculate the number of trials taken to learn the material in the beginning and then note down the saving of trials on relearning it after some lapse of time. For example, if a subject takes 10 trials to recite a whole poem correctly, and only takes six trials to master the same after two days, his saving score would be:

$$\frac{10 - 6}{10} = \frac{4}{10} \text{ or } 40\%$$

The third method is that of **recognition**. In a typical recognition test, a learner's ability to recognize items he has just studied is tested, by showing him the study items together with new items and asking him to identify the study items.

The fourth method is the method of **reconstruction**. In this method, a learner first learns the material in a serial order and then the items of the learning material are mixed up and shuffled. Then the learner is required to rearrange the items in their proper sequence.

Important Characteristics of Childhood Memories Recalled in Later Life

Dudycha and Dudycha, well known for their work on memory, made extensive reviews of other investigations in this area and drew the following conclusions:

- (i) For most people, the earliest remembered experiences date back to their third or fourth year of life.
- (ii) Women tend to recall earlier memories than men (a differential language development).
- (iii) There is a recall of visual memories which predominated their earlier experiences.
- (iv) The reports are better than two to one in favour of the recall of pleasant memories as against unpleasant ones.
- (v) Some indications are that the more intelligent the adult, the earlier memories are better recalled.
- (vi) Fear and joy appear are the most common feelings associated with early memories.
- (vii) There is little evidence of racial difference at the age in which first experiences are recalled.

Significant Facts on Memory and Forgetfulness at Old Age

1. **Learning:** Older people are more cautious about learning, need more time to integrate with responses, are less capable of dealing with new material that cannot readily be integrated with earlier experiences, and are less accurate than younger people.

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2. Reasoning: There is a general reduction in the speed with which an individual reaches a conclusion in both inductive and deductive reasoning. This is partly the result of the tendency to become increasingly cautious with age.

3. Creativity: Older people tend to lack the capacity for, or interest in, creative thinking. Thus, significant creative achievements are less common among older people than among younger ones.

4. Memory: Older people tend to have poor recent memories but better remote memories. This may be partly due to the fact that they are not always strongly motivated to remember things and partly because of lack of attentiveness.

5. Recall: Recall is affected more by age than recognition. Many older people use cues, especially visual and auditory ones, to aid their ability to recall.

Reminiscence: The tendency to reminisce about the past becomes increasingly more marked with advancing age. How much the individual reminisces depends mainly on whether his present living conditions are pleasant or unpleasant.

Vocabulary: Deterioration in vocabulary is little in old age because the elderly person constantly uses words, most of which he had learnt in his childhood or adolescence.

6. Mental Rigidity: The mental rigidity that sometimes sets in during middle age often becomes more pronounced as the person grows old, partly because he learns more slowly and with difficulty than he did earlier, and partly because he believes that old values and ways of doing things are better than new ones.

General Characteristics of Children’s Memory and Adult’s Memory

Children’s Memory	Adult’s Memory
1. Children have a mechanical memory, it is by mechanical repetition that they remember facts.	1. Adults have an understanding memory.
2. Children commit to memory without any logic.	2. Adults have a logical memory. They observe facts intelligently and organize them logically in their minds. This makes assimilation of facts possible.
3. Memory of children is short lived. They are not able to retain it for long.	3. Adults have relatively a long-lived memory.
4. Children learn more quickly and retain their impressions in a better way about concrete things.	4. Adults have a better memory of concrete things as well as abstract ideas.
5. Children recall facts spontaneously. Past experiences are recalled without any effort. Their memory is of passive type.	5. Adults have an active memory. They have to make a conscious and deliberate effort to recall facts.

Memory Development and Improvement: Favourable Conditions for Memorization

A question that is often asked is whether it is possible to improve memory? The answer is that poor memory, if not due to innate factors but due to faulty methods of teaching and learning, can be improved. By following appropriate methods of teaching and learning, improvement of memory on an appreciable extent is possible.

1. **Interest:** For proper memorization, interest in the topic or subject is essential. As the saying goes, 'you can take the horse to water for drinking but you cannot make him drink unless he is interested in drinking,' similar is the case with children.
2. **Motivation in Learning:** Motivation creates an interest and produces the right condition for memorization.
3. **Will:** Will to learn a topic or subject enhances interest and motivation, and thereby it leads to better retention.
4. **Association:** The law of association is very helpful in memorization.
5. **Law of Exercise and Intelligent Repetition:** Repetition and its quality affects memorization. Several psychological experiments have proved that the items repeated more often are remembered longer. However, repetition should be with proper understanding.
6. **Spaced Repetition:** The matter to be memorized should be repeated at intervals with periods of rest. This will save the learner from fatigue. Effort-rest-effort will lead to better memorization.
7. **Use of Progressive Methods of Teaching and Learning:** The project method and the problem method are very helpful in making the matter interesting. Students assimilate the matter easily and retain for a longer period.
8. **Use of Modern Technology:** A variety of aids should be used in the teaching and learning processes to make students motivated for the lesson. They help in enhancing the concentration of students.
9. **Whole or Part Method:** There are two methods of memorization: Whole method and part method. For example, when a whole poem is read again and again from the beginning till the end, it is known as the whole method of memorization. When a poem is divided into parts and sub-parts and each part is memorized separately, it is part method.

Experiments by Payne and Synder have shown that the whole method is better for poems containing up to 240 lines but for longer poems, the part method is better.

Both of these methods have merits as well as demerits. Which of the two would be more suitable, depends upon the situation and the nature of the matter to be memorized. The whole method is found better than the part method in case of memorizing a small poem. The part method is more suitable

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when the poem to be memorized is a larger one. In several cases, a combination of the part and the whole method has been found useful. In the combined method, the learner initially starts by the whole method and tries to locate difficult areas. These difficult areas are attended to through the part method. After that, the learner again uses the whole method and is able to memorize it successfully.

It is generally observed that the children learn faster through the part method and the adults with the whole method. While intelligent children usually learn faster with the whole method, use of the part method is more useful if the matter to be remembered is difficult.

- 10. Recitation:** In this method, the learner tries to recite and recall the subject-matter without looking at the paper at times. In this method, the learner checks upon himself from time to time. According to A I Gates (1942), in this method, weak connections are easily discovered and more attention is paid to them. The sense of accomplishment encourages the learner to put greater effort. Errors are easily detected and are soon eliminated, through recitation.
- 11. Over-learning:** Over-learning implies a practice that continues after a perfect recall has been established. Over-learning leads to better retention. However, over-learning should be moderate. While excessive over-learning leads to boredom, under-learning hinders retention.
- 12. Use of Mnemonics:** Mnemonic devices are useful in retaining several types of material. Through this device, information in the brain is deliberately transformed into meaningful system to improve memory. For instance, aims of education may be memorized with the aid of seven R's.
 - The seven R's denote Reading, Writing, Arithmetic, Rights, Responsibilities and Recreation.
 - A's may represent Age, Ability and Aptitude of students while referring to individual differences.
 - H's may denote four aims of education: Development of Head, Hand, Heart and Health.
- 13. Meaningful Organization of the Subject-Matter:** One of the most effective methods to improve memory or retention which teachers can use is the meaningful organization of the subject-matter. Approach should be logical-cum-psychological.
- 14. Formation of Clear Concepts:** Efforts should be made to improve memory with the help of illustrations, and various types of audio-visual aids.
- 15. Principle of Learning by Practice:** Learning experiences acquired through practice are remembered for a longer period.
- 16. Overall Classroom Environment:** It includes proper physical conditions and the attitude of the teacher.

Forgetfulness

Forgetfulness is usually regarded as a liability and memory as an asset. It is the opposite of learning. Forgetfulness is considered as an evil of life as several times necessary things are forgotten but not the unnecessary ones.

We come across different kinds of experiences every day. As a matter of fact, every minute we get many impressions about many things. However, we cannot remember all these impressions and it is not essential to do so. We must be selective in remembering and forgetting. It is important for us to forget several experiences daily. To remember, we must forget. We forget to remember. We should make all possible attempts to remember only those facts which are useful for us.

Forgetting is the opposite of learning. In learning, the learner keeps an experience in memory while in forgetting he fails to bring it to the conscious mind what he has remembered.

The following definitions would help us to understand the nature and concept of the word 'forgetfulness'.

According to Adams, "True learning is judicious forgetting."

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

Nunn stated, "Forgetting is failing to retain or able to recall what has been acquired."

According to Freud, "Forgetfulness is voluntary for it is on account of unwillingness to remember."

Watson, on the other hand, was of the view that forgetfulness is caused by the absence of verbal association.

Theories of Decay

There are nine major theories of decay:

1. Theory of Disuse
2. Theory of Interference
3. Theory of Trace-Change
4. Forgetting as Retrieval Failure Theory
5. Motivation and Forgetting Theory
6. Consolidation and Retrograde Theory
7. Lack of Organization Theory
8. Psychoanalytical Theory of Forgetting

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- 1. Theory of Disuse:** The common view is that forgetting is a process of fading with the passage of time. According to this view, impressions created by learning fade away with the passage of time. We meet a man and forget his name after some time. Tolman Conard and Brown tend to support this view. McGeoch, on the other hand, does not accept this view.
- 2. Theory of Interference:** Forgetting occurs when memories of the same type interfere with each other. A possible explanation for this is that when two very similar brain patterns are involved, the wrong one may tend to be activated if it has been activated more frequently, more recently or more intensely in the past.
- 3. Trace Change Theory:** Forgetting, according to this theory, is attributed to changes in traces in the brain.
- 4. Forgetting as Retrieval Failure:** According to this theory, forgetting is not losing something but rather being unable to find it. Forgetting is often a temporary phase rather than a permanent phenomenon.
- 5. Motivation and Forgetting:** An experiment conducted by Zeigamik explained how motivation can influence retention. Subjects were able to recall incomplete task, as in their case, the motivation was not satisfied.
- 6. Consolidation Theory and Retrograde:** According to this theory, if the newly formed traces are not given time for consolidation and they are disturbed, they would be wiped out.
- 7. Lack of Organization Theory:** Several people forget on account of lack of proper organization and systematization of the material learnt.
- 8. Change of Stimulating Conditions Theory:** Forgetting takes place on account of changes in stimulating conditions. For example, a young man is used to playing a popular song on his flute. If he is given another flute, he may not be able to recall the same song. In this case, the forgetting is caused simply by a change in the stimulating conditions.
- 9. Psychoanalytic Theory of Forgetting:** Certain unpleasant events, incidents and names associated with a sense of guilt or shame are automatically forgotten. Psychoanalytic approach suggests that an omission or an error in writing or a slip of tongue or inability to recall or recognize is on account of the unconscious desire to do so.

Curve of Forgetting

H Ebbinghaus made a detailed study on forgetting and published his findings in 1885. According to him, forgetting starts as soon as we stop learning some material. As a matter of fact, the processes of learning and forgetting go together. The speed of forgetting is given as follows:

Time	% of Forgetting
After 30 minutes	50%
After 6 hours	60%
After one day	66%
After 6 days	72%
After one month	80%

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Ebbinghaus pointed out that to be more effective a lesson should be revised immediately as has been taught or learnt. The most practical conclusion of Ebbinghaus's experiment was that we should learn and relearn the material which we want to study. Studies conducted by T Boreas (1930) gave more or less the same results.

Figure 9 shows the curve of forgetting. Its main characteristic is a rapid fall immediately after learning and a gradual flattening out with the increase in time interval. Hence, it is concluded that the rate of forgetting is most rapid in the beginning but as time advances, it gradually slows down.

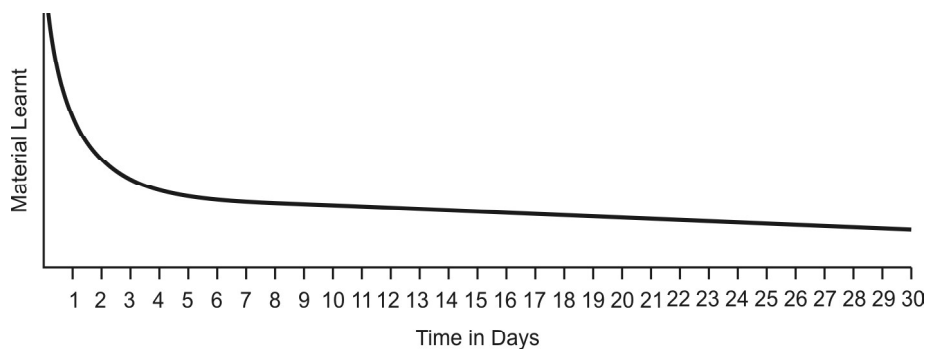


Fig. 9: Learning curve.

Causes of Forgetting

1. Lack of interest in work
2. Discontinuation of activity
3. Lapse of time
4. Lack of integration and synthesis. This may be due to:
 - (i) Interference of another activity
 - (ii) Continued experience of various kinds, all serious in nature
 - (iii) No time for rest after serious activity for integration and synthesis
5. Emotional disturbance
6. Fatigue
7. Morbid forgetfulness on account of unpleasant and painful experiences

Remedies for Forgetting

Distributed Learning: Retention is better if the learning material is spread over suitable sittings.

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Recapitulation and Review: The lesson or experience needs to be recapitulated or reviewed.

Over-learning: Studies have shown that an over-learned lesson is better retained than one barely learned. However, over-learning at times can be tiresome and uninteresting.

Nature of Learning Material: Meaningful material is better retained than material which is confusing.

Organization of the Learning Material: Material which is properly related and organized is easily retained than the material which is unrelated and disconnected.

Vividness: Vivid impressions backed by illustrations and aids are better retained.

Usefulness of Forgetting

Forgetfulness is not entirely a disadvantage or an evil. To some extent, forgetting is a **restorative** process for getting back to normal. It is said, "The healing of a wound is a sort of biological forgetting."

Forgetting is very essential as relevant things are remembered better and irrelevant things are forgotten. Everything we learn cannot be retained forever. Otherwise, it would be continually bobbing up, disturbing us and interfering with our adjustment to new situations. Recall of the old interferes with learning of the new. As observed by Adams, "True learning is judicious forgetting."

4. PERCEPTION

Our senses are described as '*gateways of knowledge or windows of the mind and soul.*' We receive all our information of the outside world through the five sense organs. An essential feature of a sense organ is that it has the property to respond to certain outside stimuli on its own. Thus, eyes respond to light and tell us of the brightness and colour. A sensation is a response or reaction aroused within the body by the stimulus. A sensation is awareness of the bare quality of experience and arises directly from stimulation of a sense organ. A sensation is an elementary mental process. It is the simplest form of mental life. We get a sensation only when some sense organ is stimulated but it is not every type of stimulation to which a sense organ responds.

Perception is sensation plus meaning. We sense qualities and we perceive objects. Perception gives meaning to sensation. Sensation is awareness of objects and perception is the awareness of *this* or *that* object. For example, we hear a

mere sound. It is a sensation and when we know that it is a song, it becomes a case of perception. The sound may be of a buzzing bee or a car, etc. Perception involves two processes; it involves a sensation through the stimulus of a sense organ and an interpretation of the sensation. Perception is sensation plus thought. According to William James, "Perception is the consciousness of particular things presented to senses." Sensation is merely a part of perception.

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Nature and Characteristics of Perception

1. Perception is one's personal interpretation of an external event.
2. Perception is the result of a previous experience.
3. Perception is always an act of integration.
4. Perception varies with attention.
5. Perception varies according to one's subjective and objective point of view.
6. Perception is greatly influenced by goals.
7. Perception is selective.
8. Accurate and efficient perception depends on the normal functioning of sense organs.

Educational Implications

The importance of sense training in education has been recognized and emphasized by all educators. However, Madam Montessori was one of the pioneers to give maximum importance to sense training in the Montessori method. Her *didactic apparatus* consisting of coloured pieces of woods for telling or understanding weight, height, thickness, etc., is designed to train senses. The modern order in teaching-learning is: things, thoughts and words. Perception is built up from experiences. Gradually, through the activity of the sense organs, a child is able to distinguish between things by analyzing his environment.

Concept Formation

Concept is the basic unit of all types of learning. A concept relates to a class of objects or ideas which have one more common characteristic. A concept is a class of stimuli which have common characteristics. The stimuli may be a class of objects, events or ideas.

We learn concepts from infancy till old age. We use old concepts in new situations and also learn new concepts from experiences. Individuals differ in their level of concept formation on the basis of their age, intelligence and experience.

Children first learn concepts of simple objects around them, such as milk, water, mother, cat, dog, tree, father, etc.

After this, they learn about objects which are not near them and with which they may not have any contact such as well, canal, river, sea, mountain or snow, etc. Thereafter, children learn relational concepts, such as half, bigger, etc.

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As children grow older, they have to learn abstract concepts like goodness, honesty and kindness.

Humphrey defined concept as, “The psychological process by which we perceive or react to similarities in the changing environment. The process by which we discover the feature or features which are ‘common’ to a large number of objects and associate these with a symbol which thereafter may be applied to other similar objects is called ‘Concept Formation’”.

Process of Concept Formation

The process of development of concepts involves four elements: experience (exploration), abstraction, generalization and analysis.

- (i) Experience is the process of direct participation in an action.
- (ii) Abstraction is the process of discovering the common elements in a large number of situations after experiencing them. One observes that two or more objects are alike or similar in some respects and different in other aspects. For example, in acquiring the concept ‘dog’, a child may hear the word ‘dog’, while playing with a rubber dog. Later, he hears the same word while playing with a wooden dog, and while looking at the picture of a dog. He hears the word ‘dog’ over and over in different situations and learns to apply the word to any object that has the same general characteristics as a dog. Thus in the *early* stages of development of the concept, the child may apply the word to cats or any four-legged animals, as till then he has observed only one ‘common’ element in his experience, namely, four-legged. Additional observations and finer discrimination will ‘define’ the concept to the point where the word will be applied ‘only’ to dogs.
- (iii) Generalization is the process of *extending* the concept to include objects which possess a quality in common with other objects but which have *not* been experienced as any of the objects in the abstraction process. Quite obviously, a concept is learnt through trial and error reaction to objects, situations or events. This refinement and enrichment of a concept depends upon the number and variety of trial and error reactions of experiences involved in the development of the concept.
- (iv) Analysis is a systematic procedure applying techniques for analysis of academic content which are similar in intent to those employed by task analysis, in designing training sequences for a job.

Bruner's Model of Concept Learning

J S Bruner suggested a model on concept attainment and structure for teaching. He proposed that economy of thinking and responding requires that we categorize phenomena according to their common attributes. An attribute is a property or characteristic of an object which differentiates it from others. Colour, texture, form, size, number of parts, position and sound, in Bruner's view, are some examples of attributes. According to him, objects having common characteristics are categorized into one group. For example, certain animals having four legs, a tail and a barking voice are categorized by us as dogs. Similarly, we can also categorize more abstract concepts such as enemy or friend, artisan or professional, etc. For teaching a concept, the teacher must identify the attributes of the concept which differentiate it from others. For example, dogs and cats both have four legs and a tail, but a cat's voice is different from a dog's.

Bruner studied the different strategies people use for acquiring concepts. For this, he used a set of cards, some cards with borders and others without. All the cards had figures varying in shape (square, circle or cross), colour (red, green or black) and number (single, double or triple). Each card thus combined had four attributes: figure shape, figure number, figure colour and presence or absence of borders. Each attribute had three values (variations) as listed above. The subject was told that the experimenter had a concept in mind, say red circles, and that the subject was to identify the particular concept. The subject was asked to select a card and then asked by the experimenter whether or not the card was an instance of the concept. With these data in mind, the subject would select another card to determine further the attributes of the concepts and would continue doing so till he found the answer, i.e., the card with red circles.

Bruner thus identified four strategies in concept attainment: (i) simultaneous scanning strategy, (ii) successive scanning strategy, (iii) conservative focusing strategy, and (iv) focus gambling strategy.

1. Simultaneous Scanning

In this strategy, the subject uses each positive instance (each correctly identified card), to deduce the combinations of attribute values which are no longer valid. However, the subject must keep in mind simultaneously all the rejected combinations in order to narrow down the range of subsequent alternatives. This technique is not very efficient since it places a great deal of strain on the subject's memory.

2. Successive Scanning

In this technique, the subject makes an overall estimate of all correct characteristics of the concept and then test each, one by one. This is called successive scanning since the subject tests individual hypothesis about the correct characteristic one at a time in succession. This technique is also inefficient as the subject may choose redundant cards which give no new information.

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3. Conservative Focusing

In this strategy, each attribute is tested by selecting a card that is different from the focus card in only one attribute. If the new card is still a positive instance, then the subject knows that the varied attribute is not a part of the concept. If, however, the changed attribute yields a negative instance, then the attribute is a part of the concept. For example, the concept to be attained is “red circles”. Assume that the subject encounters a positive card with three red circles and two borders. This card becomes the focus card and each variable is examined by selecting additional cards. The selection sequence is given below. A plus sign in the parentheses means the card is a positive instance of the concept, a minus sign in parentheses that the card is a negative instance.

Four cards:

- 3 red circles, 2 borders (+) 2 red circles, 2 borders + first decision; eliminate “three figures” as a relevant variable.
- 3 green circles, 2 borders (-) second decision: retain red as relevant attribute value.
- 3 red crosses, 2 borders (-) third decision: retain circle as relevant attribute value.
- 3 red circles, 1 border (+) fourth decision: eliminate “two borders” as relevant attribute value.

Conclusion: The concept is “red circle”.

This technique is more efficient since the subject uses a correct instance as a point of reference and selects additional cards to test the value of each attribute individually.

4. Focus Gambling

In this strategy, the subject focuses on a correct card, but more than one attribute is varied at a time. This technique can give early result if cards chosen yield a positive instance. If, however, the subject encounters a negative instance, he cannot tell which attribute was essential. In that case, he has to revert to simultaneous-scanning technique to test hypotheses. This strategy is called gambling since the subject takes a chance varying two attributes at a time.

Bruner’s strategies of concept learning can be applied to teaching science. The use of discovery and enquiry techniques in teaching science provides the pupils with experiences quite similar to the card tasks used by Bruner. For example, if we want the pupils to invent their own system of classification of plants and animals, they can do it by identifying the attributes and putting the plants or animals with common attributes in one group.

Attributes or Characteristics of Concepts

1. **Differences in Learnability:** Some concepts are easily learnt than others by children with similar cultural experiences and knowledge of languages.
2. **Usability:** In daily life, some concepts more frequently used than others.
3. **Validity:** Concepts in physical sciences are well defined than concepts in social sciences.
4. **Power:** There are some fundamental concepts in various disciplines which are necessary to learn in the beginning to understand other concepts. Thus, the attribute of power of a concept implies the extent to which a particular concept is essential for the attainment of other concepts.
5. **Types of Concepts:** Concepts are of numerous kinds. Relational concepts are either smaller or bigger, shorter or taller, etc., abstract concepts include gentleness, honesty, kindness and love, etc.
6. **Instances of Perceptibility:** A plant has many instances of perceptibility which can be sensed, as a plant can be seen and smelled whereas eternity has no perceptible instance. Thus, certain concepts may be imaginary rather than actual instances.

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Principles of Concept Formation

H J Klausmeier and Richard E Ripple in their book, *Learning and Abilities* (1971), described the following principles of concept formation:

1. Principle of likeness and differences among things
2. Principle of cognizance of attributes
3. Principle of correct terminology
4. Principle of proper sequence of instances
5. Principle of analysis of concepts
6. Principle of generalization of concepts
7. Principle of self discovery of concepts
8. Principle of use of concepts
9. Principle of independent evaluation

Essential Elements of Concept Learning

Concepts should be explained through as many examples as possible. Concepts should be taught through the process of connecting subject matter, while the process of abstraction comes at a later stage. An analysis of a concept reduces its complexity. Positive examples are more useful and repetition is very important at various stages.

Table 1: Simple Activities Relating to Concept Formation**NOTES**

Concept	Activity/Experience
1. Formation of number concept	(a) Number rhymes (b) Number games (c) Number puzzles
2. Formation of time concept	(a) Time perception cards (b) Improvised clock.
3. Formation of colour concept	(a) Rhymes and songs (b) Dramatization (c) Experiences with objects, cards and clothes.
4. Formation of concept of temperature	(a) Activities with an improvised thermometer (b) Simple experiments.
5. Formation of concept of physical environment	(a) Sand and water play (b) Simple experiments with air/water, etc.
6. Formation of concept of social environment	Celebration of festivals.

Teaching Concepts Correctly

Though there are several ways to teach concepts, efforts should be made to teach them correctly and properly from the very beginning. It should be kept in view that if teaching methods or techniques are faulty, it would lead to the formation and development of incorrect concepts. Verbal explanation must be supplemented by teaching aids and sufficient number of examples.

There are various methods of teaching concepts as below:

- (i) Direct Method:** One of the best ways of helping children acquire the concept of an object is through direct experience. For example, if children have to learn about flowers, they should be encouraged to see and observe different kinds of flowers.
- (ii) Teaching Aids:** Though direct experiences leave a lasting impact on a child's mind, they are not always possible. For example, it is just not possible to bring a lion into the classroom. Nor it is always feasible to take children to a zoo. As there are several objects which are not found in children's environment, acquiring the concepts of such objects are helpful through teaching aids. Through teaching aids, like pictures and models, children can be given an idea of these objects.
- (iv) Association:** New concepts are easily understood when they are associated with the old ones. Children should be provided with numerous instances of the concept and helped to verbalize the concept in the form of definition.
- (v) Self discovery:** Children should be encouraged to differentiate between old concepts and new concepts and to form their own concepts.

Thinking

It is because of their thinking ability that human beings are superior to animals and are called rational beings. Thinking is a special gift provided by nature to man. Thinking is a process like perceiving and remembering.

Thinking is of several kinds, such as reverie, association, reasoning, imagination, day-dreaming. All these kinds of thinking are not different from each other but merge into one another. There is free thinking in reverie, whereas in association and reasoning, thinking is controlled. While in imagination and day-dreaming, there is least control. Creative thinking and reasoning are highly controlled processes.

A number of concepts, when combined together, result in what we call *thinking*. If the concepts are wrong, then our thinking will be faulty. Thinking is correct only when the concepts formed are objective.

Following are the tools of thinking:

1. Perceived, recollected and imagined objects. This include: (i) Concrete objects, (ii) Generalized objects, (iii) Objects with dynamic properties.
2. Concepts
3. Language

Reasoning

Reasoning is a form of thinking which takes place when an individual has to solve a problem. A problem is a situation for which an individual has no readymade answer. For solving the problem, an individual takes the help of reasoning. Individuals differ a good deal in their ability to reason. People also differ in their ability to reason in different fields.

There are three types of reasoning:

1. **Induction:** By induction we mean deriving a general principle from particular facts.
2. **Deduction:** It is the reverse of induction. A general principle is applied to a particular situation.
3. **Analogy:** Analogy is establishing a new fact from the given facts.

Imagery

Imagery is derived from the word image. According to Drever, "Image is our apprehension of an object or objects in the absence of object or objects themselves, which originally determined our sense perception." When we form images, the process is called imagination.

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5. INTELLIGENCE

There is no unanimity among writers and psychologists regarding definition on intelligence. In fact, there are as many definitions of intelligence as there are writers on the subject.

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P B Ballard (1913) observed, “While the teacher tried to cultivate intelligence and the psychologist tried to measure intelligence, nobody seems to know what intelligence was.” On account of the different ways in which intelligence is interpreted, it has become less acceptable and more exposed to criticism by psychologists. Nevertheless, it is traditionally acknowledged by parents and teachers that intelligence is the most important single variable which affects success in school and in life. In general terms, intelligence means the manner with which an individual deals with facts and situations. Intelligence is the aggregate or the global capacity of the individual to act purposefully, to think rationally and to deal effectively with the environment. According to Prof. R R Kumria, “Call it practical wisdom, call it commonsense, call it genius—it is just the same in different names and grades.”

Four-fold Classification of Definitions of Intelligence

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

The first group of definitions places the emphasis upon the adjustment and adaptation of an individual to his total environment or to its limited aspects. According to this group, intelligence is general mental adaptability to new problems and to new situations of life.

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

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

The fourth category refers to the operational definitions.

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

I. Ability to Adjust

1. *A Binet* (1905) defined intelligence as, “The ability of an individual to direct his behaviour towards a goal.”
2. According to *Boyniton*, “It is an inherited capacity of an individual which is manifested through his ability to adjust and reconstruct the factors of his environment in accordance with the most fundamental needs of himself and his group.”

3. *Burt* (1949) observed, "It is the power of readjustment to relatively novel situations by organizing new psycho-physical coordination."
4. *FN Freeman* (1937) said, "Intelligence is represented in behaviour by the capacity of the individual to adjust himself to new situations, to solve new problems, to learn."
5. According to *Johnson*, "It stands for an ability to solve the general run of human problems to adjust to new situations."
6. *J Piaget* (1926) defined intelligence as "Adaptation of self to physical and social environment."
7. *Peterson* was of the view, "It is a mechanical means for adjustment and control."
8. For *Pinter* (1921) intelligence meant, "The ability of the individual to adapt adequately to relatively new situations to life."
9. According to *Stern* (1941), "Intelligence is a general capacity of an individual, consciously to adjust his thinking to new environment."
10. *Van Wagemen* was of the view, "It is the capacity to learn and to adjust to relatively new and changing conditions."
11. *William James* (1907) observed, "It is the ability to adjust oneself successfully to a relatively new situation."
12. *William McDougall* (1923) defined, "It is the capacity to improve upon native tendency in the light of past experience."

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II. Ability to Learn

13. According to *Buckingham* (1921), "Intelligence is the learning ability."
14. *Calvin* believed "It is the ability to learn."
15. *Spearman* (1927) said, "Intelligence may be thought of in terms of two abilities, i.e., 'g' or general and 's' or specific."
16. *LL Thurstone* (1946) defined intelligence in terms of five primary abilities.
17. *Woodrow* observed, "It is the capacity to acquire."

III. Ability to Do Abstract Reasoning

18. For *C Spearman* (1927) intelligence was the "General intelligence which involves mainly the education of relations and correlates."
19. *EL Thorndike* (1931) said, "We may define intelligence in general as the power of good responses from the point of view of truth or fact".
20. *Gates and Others* (1955) observed, "It is a composite organization of abilities to learn, to grasp broad and subtle facts, especially abstract facts, with alertness and accuracy, to exercise mental control and to display flexibility and sagacity in seeking the solution of problems."

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21. *Henry Garrett* (1946) was of the view, “The abilities demanded in the solution of problems which require the comprehension and use of symbols, i.e., words, numbers, diagrams, equations, formulae.”
22. *JMHunt* (1966) defined, “The technique that a child acquires for processing information supplied by his senses.”
23. *LM Terman* (1921) pointed out, “An individual is intelligent in proportion as he is able to carry on abstract thinking “
24. According to *Munn*, “Intelligence is the flexibility or versatility to the use of symbolic processes.”
25. *PE Vernon* (1927) defined intelligence as, “All round thinking capacity or mental efficiency.”

IV. Operational Definitions

26. In the words of *Boring* (1948) “Intelligence is what intelligence tests.”
27. *Dockell* (1970) observed, “Intelligence might be taken to mean ‘ability’, i.e., what a person can do at a moment.”
28. *DO Hebb* (1949) described three situations in which the term intelligence could be used.
29. According to *DW Wechsler* (1950), “Intelligence is the aggregate or the global capacity of the individual to act purposefully, to think rationally and to deal effectively with the environment.”
30. *GD Stoddard* (1943) said, “Intelligence is the ability to undertake activities.”
31. According to *Hein*, “Intelligence is the activity consisting in grasping the essentials in a situation and responding approximately to them.”
32. *PE Vernon* (1927) defined, “Intelligence is what intelligence test measures.”
33. *Well* observed, “Intelligence is the property of recombining our behavioural pattern as to act later in novel situations.”

Brief Historical Review and Evaluation of Definition of Intelligence

Alfred Binet (1905), a French psychologist, was the first to take interest in the concept of intelligence. He defined intelligence as the “ability of an individual to direct his behaviour towards a goal, to make adaptation in his goal-oriented behaviour when necessary, to know when he reached the goal.” Comprehension, invention, direction and censorship: intelligence lies in these four words. Terman (1916) defined intelligence as “an individual’s ability to carry on abstract thinking.” In the words of Thompson, “The definition presented by Terman probably reflects most adequately our present functional definition of intelligence.” Thorndike (1926) further elaborated the definition given by Terman. He defined intelligence in terms of three somewhat independent dimensions: (i) Attitude, (ii) Breadth, and (iii) Speed.

In 1946, Thurstone identified the following, more or less, mutually exclusive components of intelligent behaviour.

S, or space factor: The ability to visualize flat or solid objects, heavily involved in mechanical aptitude.

N, or number factor: Ability in the carrying-out of the rather simple numerical exercise similar to those used by a cashier.

V, or verbal comprehension factor: Ability to deal with verbal concepts, e.g., verbal reasoning, and vocabulary availability.

W, or word fluency factor: Ability to produce words in a restricted context, i.e., a child may be fluent even though he has a small vocabulary.

M, or memory factor: Ability to store and reproduce perceptual-conceptual materials.

Induction factor: Facility in discovering the principle or rule that applies to a series of problems.

Deduction factor: Only a small amount of evidence for—ability to apply a given principle to a series of specific problems.

Flexibility and speed to closure: Ability to interpret instructions quickly, facility to size up a problem situation quickly; flexibility is the ability to abandon one configuration in favour of a more promising one.

G D Stoddard and B L Wellman (1934) offered a seven-category definition of intelligence. According to them, “Intelligence is the ability to undertake activities that are characterized by:

- | | |
|---|-----------------------|
| (a) Difficulty, | (b) Complexity, |
| (c) Abstractness, | (d) Economy, |
| (e) Adaptiveness to a goal, | (f) Social value, and |
| (g) The emergence of originals and to maintain such activities under conditions that demand a concentration of energy and a resistance to emotional force.” | |

J P Guilford (1950) was of the view that these definitions ignore the important concept of creativity and thus provide a narrow approach to intelligence.

D Wechsler (1950) concluded that general intelligence is more than a combination of the cognitive functions identified by Thurstone and others. He said, general intelligence is influenced by certain cognitive factors like drive, will, perseverance and persistence; by certain emotional factors like anxiety and impulsiveness; and by other more general personality characteristics.

G Thompson (1975) summed it up as, “There is no absolute definition of intelligence. A theoretical construct may be changed any time. According to the law of parsimony, the simplest yet most fruitful definition will eventually prevail. Thurstone’s approach to the definition and measurement of children’s intelligence is challenging. Whether this approach will be more valuable than those of Binet and Terman, is of course unknown.”

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Scholars of Intelligence in Ancient India

Kautilya defined intelligence 'as the ability to work'.

Visnusarma called it the 'power which enables human beings to control the world'.

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The *Brahmasutra* tells us that intelligence is the gift of God and it is fixed at birth.

The *Agnipurana* prescribes diet for infants to help the growth of their intelligence.

Agadhabuddhi is the intelligence that cannot be measured or superior intelligence.

Mahabuddhi is great intelligence, *malin buddhi* is dull intelligence

Sthirabuddhi is calm intelligence.

Alpabuddhi is little intelligence.

In ancient India, intelligence was measured through conversation, physical features, gestures, gait, speech, changes in the eye and facial expression.

Chief Characteristics and Generalizations About Intelligence

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

Intelligence and Influence of Environmental Factors: It is certainly justifiable to assume that love, affection, concern and generosity, when judiciously bestowed on growing children, have desirable effects. Poor environments retard the development of intelligence.

The growth of intelligence in certain children may be retarded due to certain unfavourable circumstances and when these are removed, intelligence begins to grow and functions normally.

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

The unintelligent or the dullard fail to think of new situations. They are always guided by others. They lack originality.

Distribution of Intelligence: The majority of the school children, say about 60%, are found in the IQ range 90–110 and are referred to as ‘Normal’ or ‘Average’.

Intelligence and Sex Differences: Generally speaking, the research studies show that the average scores of the sexes are strikingly similar.

Intelligence and Race Differences: Every racial and cultural group contains some gifted children. Franz Boas stated, “If we were to select the most intelligent, imaginative, energetic and emotionally stable third of mankind, all races would be represented.”

Three Broad Areas of Intelligent Behaviour

Thurstone suggested that we may recognize at least three broad areas of intelligent behaviour:

- (i) *Abstract Intelligence:* He defined this as the “ability to understand and manage ideas and symbols, such as words, numbers, chemical or physical formulas, legal decisions, scientific principles and the like....” In the case of students, this is very close to what is called scholastic aptitude.
- (ii) *Mechanical Intelligence:* This includes, “The ability to clean, to understand and manage things and mechanisms, such as a knife, a gun, a moving machine, and automobile, a boat, and the like.
- (iii) *Social Intelligence:* “This is the ability to understand and manage men and women, boys and girls to act wisely in human relations.”

Intelligence Curve

If we measure the intellectual development against chronological age from birth to adolescence using a random subject, we will obtain an S-shaped curve as depicted in Fig. 10.

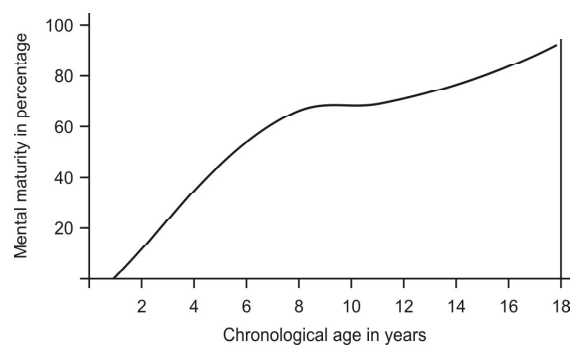


Fig. 10: Intelligence Curve

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The following points come to light from the curve:

- 1 During early childhood, there is a period of relatively rapid growth of intelligence, followed by a slower rate during adolescence.
- 2 During childhood, the curve is more or less linear.
3. Mental development reaches almost at its maximum during early adult years.

Non-definable Nature of Intelligence

Some argue, “We can measure electricity without being able to define its precise nature. But we can put electricity to use and measure it. So we can use and measure intelligence.”

Relation of Intelligence with Different Occupations: Usually scholars, executives in business and government, and scientist possess high abstract intelligence.

A successful civil engineer presumably possesses high abstract as well as high mechanical intelligence. Similarly, other types of engineers possess a combination of like abilities.

A successful criminal lawyer possesses high abstract as well as social intelligence.

Mechanics, expert carpenters and plumbers possess above normal mechanical intelligence

Of course, these are generalizations are crude.

Theories of Intelligence

Psychologists have attempted to understand the structure of intelligence for which they have formulated several theories. Among the important theories, the following deserve special mention.

1. Spearman’s Two-Factor Theory or Eclectic Theory
2. Thurstone’s Group Factor Theory or Anarchic Theory
3. Unitary Theory or Monarchical Theory
4. Oligarchic Theory or Sampling Theory
5. Guilford’s Theory
6. Thorndike’s Multifactor Theory

1. Spearman’s Two-Factor Theory or Eclectic Theory

In 1904, Spearman, an English psychologist produced strong evidence based on his own researches that there was one fundamental ability underlying all cognitive functions. According to him, every task involving intellectual activity depended upon a general ability or ‘g’ factor and a separate ability or “specific” factor. This view is popularly known as two-factor theory of intelligence, i.e., ‘g’ factor and ‘s’ factor. This ‘g’ factor represents native intelligence. Thus, when we respond to any situation or perform an intellectual task, our general mental ability or ‘g’ factor

is responsible for part of our reactions and our specific ability in that particular task is responsible for the rest, as shown in Fig. 11.

There are a large number of specific abilities, such as ability to draw inferences, ability to complete sentences, ability to continue series of numbers, ability to code messages, etc.

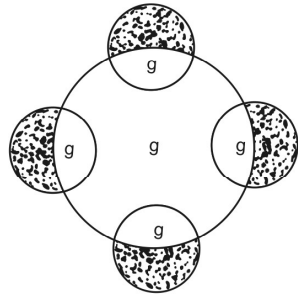


Fig. 11: Eclectic Theory or Two-Factor Theory



Fig. 12: Thurstone's Anarchic Theory, or Multiple Factor Theory

2. Thurstone's Group Factor Theory or Anarchic Theory

L.L. Thurstone, an American psychologist, propounded the group factor theory of intelligence. According to him, intellectual activity is neither an expression of numerous highly specific factors as claimed by Thorndike, nor the expression primarily of a general factor which prevails in all mental tasks as Spearman believed. Instead, as revealed by factor analysis, certain mental operations have in common, a primary factor which gives them psychological and functional unity, and which distinctly separates them from other mental operations. These mental operations are said to constitute a group 'A', similarly, another group of mental operations have their own unifying primary factor and may be said to constitute a group 'B' and so on. Thus, there are a number of groups of mental abilities, each of which has its own primary factor.

Thurstone proposed seven factors and called them primary mental abilities. These are:

1. M—*Memory*: To be able to learn and retain information. Also, to be able to recall the learned material.

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2. N—*Number*: To be able to understand quickly and with accuracy simple arithmetic computations.
3. P—*Perceptual*: To be able to identify objects quickly and accurately.
4. R—*Reasoning*: To be able to perceive and utilize abstract relationships. To be able to put together past experiences in the solution of new problems.
5. S—*Spatial*: To be able to deal with objects in space.
6. V—*Verbal*: To be able to understand and utilize verbal ideas.
7. W—*Word fluency*: To be able to think of words rapidly.

Spearman's theory is also known as '*electic theory*' because it harmonizes elements from all the main types of abilities. Thurstone's theory is also known as the '*anarchic theory*' because he conceived that the mind consists of a number of independent facilities.

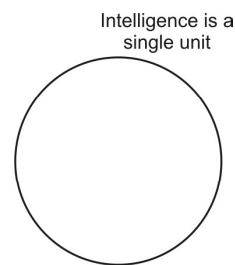


Fig. 13: Unitary Theory or Monarchic Theory of Intelligence

3. Unitary Theory or Monarchic Theory

According to monarchic attitude, intelligence is regarded as an adaptability which enables a creature to adjust itself to the changing environment. This is a popular view which regards intelligence as a unitary (monarchic) faculty that determines the level of man's achievement in any intellectual enterprise he may take. Accordingly, inborn all round mental efficiency is a sign of intelligence. Accordingly, had Newton turned his mind to poetry, he could have as well been a poet.

4. Oligarchic Theory or Sampling Theory

This theory is criticized by the advocates of Oligarchic Theory. A person cannot be expert in all fields; moreover, a single factor alone cannot be mentioned which means intelligence.

This theory is sometimes known as sampling theory of intelligence. It was put forward by Prof. Thompson. According to it, intellectual abilities belong to certain groups. It maintains that cognitive abilities are manifestations not of a single commanding faculty, but of a few main intellectual powers or a group of abilities. For example, a child who is intelligent in one group of knowledge may not be

intelligent in the other group. But he may be equally intelligent in the various subjects of that particular group (Fig. 14).

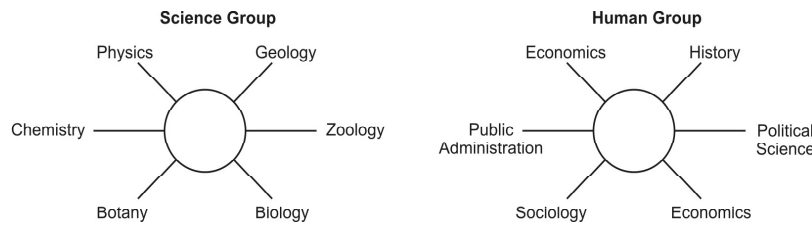


Fig. 14: Oligarchic Theory or Group Factor Theory of Intelligence

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5. J P Guilford's Theory of Structure of Intellect (SOI)

This three-dimensional theory was developed by Guilford and his associates in psychology laboratory at the University of Southern California in 1966. Work on it began in 1956. Guilford conceived the idea of intellectual functioning as having three dimensions: (i) operations, (ii) content and (iii) products.

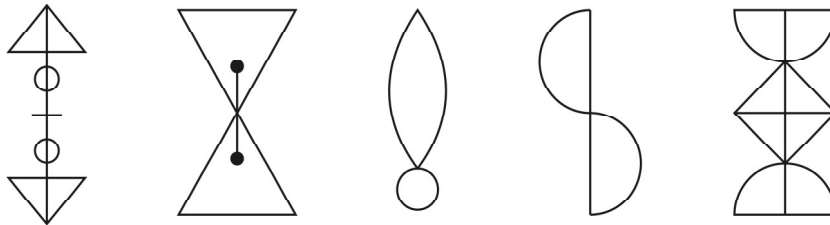


Fig. 15: Guilford's Model of Intelligence

Operations are the processes involved in intellectual behaviour-cognition, memory, divergent thinking, convergent thinking and evaluation.

The content of these operations may be figural, symbolic (letters, numbers), verbal (information about other persons), behaviour, attitudes, needs, etc.

The products may be—units, classes, relations, systems, transformations and implications. Thus, the model contains 120 cells (5 operations 4 contents 6 products); each of which represents a distinct factor which is measured by a separate test. Diagrammatically, the model can be represented as shown in Fig. 15.

Guilford suggested that the five processes act on the four units to produce one of six cognitive products. The six products are units of a single word or idea, classes, a relationship between or among units or classes, systems, an organized sequence of ideas, transformations, a change or redefinition of a unit or class, and implications, predictions of the future.

Guilford believed that each person is a unique composite of a great many different intellectual abilities. Each intellectual functioning involves three components: a cognitive operation, specific content and a specific product.

Evaluation and Educational Implications of Theories of Intelligence

Spearman's theory is criticized on the main ground that it fails to take into account sufficiently specific types of abilities and towards the later years of his life, Spearman himself had begun to realize the existence of 'group factors.'

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Thorndike's theory accords undue weightage to abstract intelligence.

Guilford's theory of intelligence seems to be the most comprehensive theory as it attempts to take into consideration all possible aspects of intellectual activity. This theory has several educational implications.

The SOI model provides knowledge about the specific ability of the students to guide them in the right direction. An analysis of the students' abilities by the guidance worker can suggest a reliable base on which future learning could be based

The SOI model is useful in finding out the reasons of the unsatisfactory performance of students in spite of their adequate intelligence. It points out that for understanding human learning and higher mental processes of thinking, problem-solving and creativity, etc., some drastic modifications would be required in our theory of curriculum construction and methodology of instruction.

The model explored 120 intellectual abilities which enables us to know whether or not we are paying adequate attention to each of them. If not, how should we improve them? The model guides us to devise enrichment programmes for the creative and the gifted children. The model discards the ideas of transfer of learning and stresses that learning of specific skills should be our focus of attention.

Fundamental Concepts Involved In Intelligence and Intelligence Testing

Chronological Age (CA) is the age of an individual in years, months, hours. This is counted from the time and date of his birth. It is symbolically expressed as CA.

Mental Age (MA): Binet, known as the father of modern psychological testing, was the first psychologist to introduce the concept of mental age. Assisted by Simon, he gave a better footing and credibility to intelligence test results. His intelligence test is known as Binet-Simon Test of Intelligence. The then French Government was faced with the problem of identifying mentally retarded children from the normal ones. This job was assigned to Binet who took about 15 years to complete it. The year 1905 is a landmark in the history of intelligence testing.

Mental age refers to 'mental maturity' of a person, corresponding to his level of performance in an intelligence test—irrespective of his CA. If a person of CA is seven years old and is able to score satisfactorily on a test meant for a child of CA 10, then the mental age of the former is 10. Mental age can also be defined as "an expression of the extent of development achieved by the individual stated in terms of the performance that can be expected at any given age." And when the

scores of a given intelligence tests are put into MA scores, we have with us the 'age scale'. Maximum mental age is 19 or 20.

Basal Age: Basal age is that age of the child with reference to his chronological age where he can solve all questions in a given test. Mental age cannot be calculated directly. It is the basal age which helps in calculating mental age. The concept of basal age may be explained with the help of the following example.

Suppose, a child's CA is 6. He solves all questions in a test meant for child of CA 7. He also does the same for a child of CA 8 and then his efficiency declines, i.e., he solves only 2 questions out of 6 questions in a test meant for a child of CA 9. The basal age of a child with CA 6 is 8 years. His mental age will be:

$$\begin{aligned}\text{Mental age} &= \text{Basal age} + \text{Partial credit} \\ &= 8 \text{ years} + 4 \text{ months}\end{aligned}$$

Thus, the child has an MA of 8.33 years.

Constancy of IQ: In 1921, Terman concluded on the basis of his studies that IQ is a sufficiently constant measure for mental classification to make it a practical and serviceable basis.

In 1933, R R Brown also came to the same conclusion.

In 1941, W F Dearborn reported that the size of the correlation between test and retest varied with intervals.

The retesting of subnormal children by Phillips in Australia also showed a decline in the rate of mental growth through 1929 to 1938 as compared with the initial IQ.

In 1945, C M Fleming found marked changes in the mental growth of children.

Studies by H E Gones in 1943 found changes in the mental growth of one boy. The boy's IQ was 98 at the age of 9, 101 at the age of 12, and from the age of 12 to 15, the range of his score was from 81 to 119.

According to W S Neff (1938), "Whether changes in IQ are due to changes in maturational process, or due to changing environments is difficult to say. But certainly those individuals who show large variations from test to retest are precisely the ones whose educational and social factors should have been teased out in the greatest detail." "This brings out the importance of the marked shifts in the total situation to produce a change in IQ and this change is found to be more significant the longer the child lives in that situation," observed Prof. Uday Shanker (1988). He further stated, "These conditions make it possible for the teacher to determine more accurately the kind of treatment required by the pupil who is showing a marked decrease in the rate of growth—either mental or physical. The teacher is thus driven back to a realization of the necessity for continuous observation, for repeated diagnosis and for perpetual remedial treatment."

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Intelligence and Success in Life

It is generally observed that, other things being equal, an individual who has higher IQ has more chances of success than the one who has lower IQ. It is also to be remembered that besides intelligence, success in life depends upon such important factors as 'motivation' and 'persistence'. See Tables 3 and 4.

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Table 3: Distribution of Intelligence
(Mean IQ obtained with the 1937 Revised Stanford-Binet Scale)

<i>If a Child's IQ is</i>	<i>He is equalled or excelled by</i>
160	1 out of 10,000
156	3 out of 10,000
152	8 out of 10,000
148	2 out of 1,000
144	4 out of 1,000
140	7 out of 1,000

<i>IQ</i>	<i>Equals or exceeds</i>	<i>IQ</i>	<i>Equals or exceeds</i>	<i>IQ</i>	<i>Equals or exceeds</i>	<i>IQ</i>	<i>Equals or exceeds</i>
136	99%	118	86%	99	48%	80	11%
136	98	117	85	98	45	79	10
135	98	116	84	97	43	78	9
134	98	115	82	96	40	77	8
133	97	114	80	95	38	76	8
132	97	113	79	94	36	75	6
131	97	112	77	93	34	74	6
130	96	111	75	92	31	73	5
129	96	110	73	91	29	72	4
128	95	109	71	90	27	71	4
127	94	108	69	89	25	70	3
126	94	107	66	88	23	69	3
125	93	106	64	87	21	68	3
124	92	105	62	86	20	67	2
123	91	104	60	85	18	66	2
122	90	103	57	84	16	65	2
121	89	102	55	83	15	64	1
120	88	101	52	82	14	63	1
119	87	100	50	81	12	62	1

The Bombay-Karnataka Revision Tests

Dr V V Kamat revised Binet's scale to suit Indian conditions and administered intelligence tests to 1,074 children and adolescents of all ages from two to 20 of both sexes. The locality selected for the experiment was the town of Dharwar. The children selected were fairly representative of the general population of Indian children.

Dr V V Kamat classified Indian children as presented in Table 5.

Table 4: Distribution of IQ on Terman Scale

IQ	Classification	Per cent
160-169	Very superior	0.03
150-159	Very superior	0.02
140-149	Very superior	1.1
130-139	Superior (High average)	3.1
120-129	Superior (High average)	8.2
110-119	Superior (High average)	18.1
100-109	Average	23.5
90-99	Average	23.0
80-89	Low average	14.5
70-79	Borderline defective	5.6
60-69	Mentally defective	2.0
50-59	Mentally defective	0.4
40-49	Mentally defective	0.2
30-39	Mentally defective	0.03

Table 5: IQ Classification by Dr Kamat

Class	Range of IQ
Near-genius or genius	140 and above
Extraordinary	130-139.9
Very superior	120-129.9
Superior	110-119.9
Average or normal	99-109.9
Backward	80-98.9
Very backward	70-79.9
Borderline	60-69.9
Morons	40-59.9
Imbeciles	20-39.9
Idiots	Below 20

Measurement of Intelligence

Intelligence tests are used to measure intelligence of an individual. It is important to note that intelligence is inferred from a variety of elements, i.e., behaviour and

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speed of doing things correctly, etc. An intelligence test is an objective and a standardized measure.

Intelligence is measured through a complicated process. It involves a comparison and establishment of a relationship between CA (Chronological Age) and MA (Mental Age). This relationship is expressed by the term IQ (Intelligence Quotient). When the mental age is divided by the chronological age and the quotient is multiplied by 100, the result is IQ.

$$IQ = \frac{MA}{CA} \times 100$$

When we want to calculate the mental age of a student, all questions assigned to that age are put to him. (In the individual scale of Binet a certain number of questions are assigned to that age). If he answers all the questions assigned to that age correctly, his mental age is equal to his chronological age and that child is considered to be an average one. Suppose you have to test a child of CA 8 on Binet scale. You will start with questions assigned to the sixth year and then go up. The child may be successful in answering correctly all the questions assigned to years 6, 7, 8 and may stop at 9. His mental age will be 8.

Intelligence is measured on the following factors:

1. **Vocabulary**—Choosing a synonym or antonym or near-synonym or near antonym.
2. **Verbal analogies**, e.g., Branch is to a tree as brook is to river.
3. **Sentence completion**, e.g., India has states.
4. **Arithmetic reasoning**. Simple arithmetic sums.
5. **Number series**, e.g., What next? 11, 13, 15 (17, 19, 21).
6. **Picture arrangement**. Arranging pictures of a story in proper sequence.
7. **Comprehension**. For testing common sense, certain cards or paragraphs are given in which some absurdity is shown.
8. **Similarities**, e.g., In what way are cotton and silk alike?
9. **General information**. From everyday life.
10. **Digit span**. For testing memory, digits are orally mentioned and the subject is asked to repeat them in the same order.
11. **Digit-Symbol substitution**. A code is given and substitution is to be carried out.
12. **Figure analogies**
13. **Classification**, e.g., Which word on the right belongs to the group on the left?

Pen, table, book, stone, pencil, radio

14. **Multimental**, e.g., Of some given figures which one does not belong to the other four.

Development of Mental Tests

Are all persons equally intelligent? Are all students fit for school instruction? Are all students capable of pursuing the same courses? Are all students fit for all occupations? Is it proper to educate all students in the same way?

These and various such questions have been engaging the attention of the psychologists for the past hundred years or so. Many attempts have been made to measure intelligence possessed by individuals so that necessary arrangements may be made to give them training according to their intelligence. Thanks to the ceaseless efforts of various psychologists, whose standardized tests are available and which can be used to measure intelligence.

Anne Anastasi observed, “Psychological testing is a relatively young branch of one of the youngest of the sciences.”

Pre-Binet Position

One of the first problems, which stimulated the development of psychological tests, was the identification of the feeble-minded. French physician **Escurioi** was the first person to write a two-volume work in 1828, in which over one hundred pages were devoted to feeble-mindedness. Another French physician who made a valuable contribution was **Seguin**, who in 1837, established the first school devoted to the education of mentally retarded children. In 1848, he migrated to America where his ideas gained recognition.

The general aim of the early experimental psychologists of the 19th century was the formulation of generalized descriptions of human behaviour and not the measurement of individual differences. Many of the early experimental psychologists received their training in a laboratory founded by **Wundt** at Leipzig in 1879.

Sir Francis Galton, an English biologist, was primarily responsible for launching the testing movement on its course. In 1882, an anthropometric laboratory was established by him in South Kensington Museum, London. In this laboratory, individuals could be measured for certain physical traits by the payment of a small fee. Galton himself devised most of the simple tests. Galton also paved the way for the application of rating scale and questionnaire methods, etc. One of his disciples, **Karl Pearson** carried his work forward.

James McKeen Cattell of America occupied a prominent position in the development of psychological testing. He used the term ‘mental test’ in an article in 1890. This article related to a series of tests which were being administered annually to college students in the efforts to determine their intellectual level. Cattell, like Galton, felt that a measure of intellectual functions could be obtained through tests of sensory discrimination and reaction time.

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Among others, the names of **Jastrow**, **Krae Pelin** and **Ferrai** may also be mentioned.

Binet and Post-Binet Era

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The early experiments of Wundt were all concerned with sensory discrimination and motor ability. His worthy pupil **Cattell** did much useful work in America. However, the credit of scientific mental testing goes to Binet and Simon. The names of **Terman**, **Cyril Burt** and **Wechsler** should also be mentioned who did very useful work in mental testing.

In India, **Dr. V V Kamat** and **Dr. C H Rice**, **Pt. L S Jha**, **Prof. S Jalota** and **Principal R R Kumria** contributed a lot in mental testing.

Binet-Simon Test

The father of intelligence testing is Alfred Binet. He disagreed with some of his contemporaries who tried to measure general intelligence by testing reaction time, rote memory, sensory activity, or muscular movements. According to him, intelligence could be estimated, only by the test of higher faculties like reasoning, comprehension, judgement, adaptability, persistence, and self-criticism. Binet worked on these lines and in collaboration with Theophile Simon, published the first intelligence test in 1905. This test had 30 items arranged in order of increasing difficulty. It took him about 15 years to complete the test.

Binet tried out these items on children and in 1908, brought out a revised scale which divided the test items into age groups from three to 11 years. At some age levels, only three questions were asked, at others five or six. With this scale, Binet introduced the concept of mental age. If a child's (whose chronological age is eight) score on a test is equal to the average score of children of nine years of age, then his mental age will be nine in spite of the fact that his chronological age is eight.

In 1911, shortly before his death, Binet published a second revision of his scale. It omitted some old items and introduced some new ones. He also brought the scale up to adult level. In this revision, he included five tests for each age except the four-year level.

Revised Test 1916

The first serious revision of Binet-Simon scale was prepared by Terman at Stanford University and was published in 1916. This revision introduced great many alternatives and new additions. The entire scale was re-standardized on an American Sample of about 1,000 children and 400 adults. For the first time, the term IQ or 'Intelligence quotient' was introduced. IQ has been defined as the ratio of mental age to chronological age. To avoid fraction, it is multiplied by 100.

Thus:

$$IQ = \frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$$

or simply
$$IQ = \frac{MA}{CA} \times 100$$

In this revision, the number of questions was 90.

1937 and 1960 Revisions

In 1937 and 1960, the Stanford University Test was revised by Merrill and Terman. It was also known as Stanford-Binet Individual Test of Intelligence. It contained 129 questions suitable for a child of two years, two and a half years, three years, three and a half years, four years, four and a half years and then for five till 14 years of ages. There were no questions for five and a half as it was thought that there was not much difference in IQ of five years and five and a half year old child.

Wechsler Scales of 1939 and 1955

In spite of its merits, the 1937 Stanford-Binet scale was not particularly suited for adults. It was not standardized on any individual over 18 years of age in obtaining the IQ. A new scale the Wechsler Scale was published in 1939 as remedy. However, even this had to be revised in 1955 and a new version Wechsler Adult Intelligence Scale (WAIS) came into existence. It applied to age ranged from 16 to 64 years.

The scale comprised the following sub-tests which fall under two broad categories:

(a) Verbal tests and (b) Non-verbal tests.

Verbal Tests: These contain the following types: (i) Vocabulary, (ii) Information, (iii) Arithmetic items, (iv) Comprehension, (v) Similarities, (vi) Digit span.

Non-Verbal Tests: These include (i) Block design, (ii) Picture arrangement, (iii) Object assembly, (iv) Mazes, (v) Picture completion.

Table 6: Comparison between Binet Test and Wechsler Scale

<i>Binet</i>	<i>Wechsler</i>
1. It is primarily for children.	1. Age ranges are from 16 to 64 years.
2. It is a mental age scale. Items are grouped in terms of mental age.	2. It is a point scale. Points are given for correct responses
3. Selection is made by relation of success by age.	3. Selection is made by function measured.
4. Items are ungraded and unrelated.	4. Items are graded.
5. The test is inflexible.	5. The test is flexible.
6. It is qualitative in evaluation.	6. It is quantitative in evaluation.

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Classification of Intelligence Tests

These may be classified under three categories:

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1. *Individual Tests*—These are administered to one individual at a time. The age group for this test ranges from two years to 18 years. The tests are: (a) Binet-Simon tests, (b) Revised tests by Terman, (c) Mental scholastic tests of Burt, and (d) Wechsler test.

2. *Group Tests*—Group tests are administered to a group of people. Group tests originated in America—when the intelligence of the recruits who joined the army in the First World War, was to be calculated. These are: (a) Army alpha and beta test, (b) Terman’s group tests, (c) Otis self-administrative tests.

Group tests are of two types (i) Verbal, and (ii) Non-verbal. Verbal tests require use of language to answer the test items. Non-verbal do not use language to respond to items.

3. *Performance Tests*—These tests are administered to illiterate persons. These tests generally involve the construction of certain patterns or solving problems in terms of concrete material. Some of the famous tests are: (a) Koh’s block design test (b) Cube construction tests, and (c) Pass along tests.

Table 7: Comparison between Individual Tests and Group Tests

Individual Test	Group Test
1. It is administered to an individual at a time.	1. It is administered to a group at the same time.
2. It is costly in terms of administration and time.	2. It is less costly in terms of administration and time.
3. A trained tester is required to administer it.	3. No trained person is required to administer it.
4. There is face to face interaction between the individual and the tester.	4. There is no such face to face interaction.
5. Individual test is more reliable. Guidance can be provided to the individual on the basis of its results.	5. Group test may be influenced by several factors.
6. It is useful for small children.	6. It is suitable for older children and adults.
7. The tester can motivate the individual by means of praise and encouragement as he can adapt to the needs of the individual child.	7. It is not possible to do so.
8. There is very little scope for cheating.	8. Cheating is possible on a large-scale.
9. There is no competition in individual testing.	9. Speed and reading ability may influence test score.
10. No special formalities are observed in individual testing.	10. Several formalities are observed in administering group testing.
11. Instructions can be made clear before testing.	11. A few members of the group may not understand the instructions clearly

Measuring Special Ability

The IQ obtained as a result of performance on an intelligent test indicates general status only. It does not point to the size of strength or weakness in each of the particular mental abilities that are being measured. For example, two students showing an IQ of 120 on a particular test may have different positions on different sub-tests; one may do very well in arithmetic and poorly in vocabulary, while the other may do well in vocabulary and poorly in arithmetic; yet both score the same total.

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Primary Mental Abilities Test (PMA Test)

To correct this sort of error, we need tests which indicate differential success of a subject on various mental abilities. The tests of primary mental abilities prepared by Thurstone meet this need. The PMA test, for ages 11 to 17, is based on the group factor theory of mental ability which postulates that intelligence is made up of certain distinct and more or less independent mental functions, which Thurstone called the primary mental abilities. The primary abilities, as measured by this test, are the following:

1. Number facility
2. Verbal comprehension
3. Spatial perception
4. Word fluency
5. Reasoning
6. Rote memory

Differential Aptitude Test Battery (DATB)

Another test to measure the special abilities is Differential Aptitude Test Battery (DATB). This comprises eight tests:

1. Verbal Reasoning
2. Numerical Ability
3. Abstract Reasoning
4. Space Relations
5. Mechanical Reasoning
6. Clerical Speed and Accuracy
7. Language Usage: Spelling
8. Language Usage: Grammar, punctuation and word usage

General Aptitude Test Battery (GATB)

Another test of the differential aptitude type is the General Aptitude Test Battery (GATB), developed by the United States Employment Service. It consists of 15

tests which cover nine factors, such as intelligence, verbal aptitude, numerical aptitude, spatial aptitude, form perception, clerical perception, motor-coordination, finger dexterity and manual dexterity.

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These sophisticated test batteries mentioned above give a much clearer picture of what special abilities a person has than the general intelligence tests.

Criteria of a Good Test

1. Reliability: A test is said to be reliable if it gives the same results whenever it is repeated. If there is no variation in a pupil's score obtained in a test today and obtained after a sufficient long time, the test is said to be reliable. The test should also give the same result, if it is applied by different persons who follow the set instructions. There are two methods which are usually employed to determine the validity of a test:

(a) The test-re-test method, (b) The split-half method.

According to the first method, the same test is applied after some months to the individuals and the scores of two administrations of the test are compared and correlation co-efficient is calculated. The test is said to be fairly reliable if the correlation is 90. In the second method, test is arbitrarily split up into two equal halves, the scores on odd and even items are counted separately and correlation co-efficient is calculated.

2. Validity of a Test: A test is said to be valid if it succeeds in measuring what it aims at measuring. The validity of a test can be judged in more than one ways:

- (a) A test is said to be valid if its results correspond to the judgment of competent judges. The scores of an individual on the test may be compared with a list prepared by the class teacher and the correlation can be found.
- (b) By comparing the scores obtained through new test with the scores compared through the Simon-Binet Test.
- (c) By correlating the results of a group test with those of an individual test given to the same group of students.

3. Objectivity: The test should be free from the personality bias of the teacher. There should be no scope in the variability of answers of different items in the test. Each question which is asked should have only one possible answer.

4. Predictability: The test should be such which can give a forecast of the possibilities of future achievements of the students.

5. Administrative ease: The test should be easy to administer in all its three stages, i.e., setting, answering and scoring.

Use of Intelligence Tests

To quote Prof. Percy Nunn, "You are forever you, and I forever I." It has been amply demonstrated by many psychologists that all persons do not have the same

intelligence and all cannot do same work with the same speed and efficiency. The assumption that given the same opportunities, all men will be equally successful, is based upon faulty foundations.

Intelligence tests are of great use in schools. To be a successful teacher, one must know one's pupils thoroughly and must possess an instrument with which one can measure the intelligence of pupils and should know the proper use of that instrument.

Binet's rod of mental measurement is an instrument for the teacher to find the exact calibre of the minds of his pupils. Intelligence tests help to discover whether a child is backward or dull or intelligent. It is not possible to gauge the intelligence of children without the use of mental tests. The children's intelligence cannot be estimated from the marks obtained by them in their school subjects. A child of 12 years and another of 14 years may be put on the same level if they obtain the same number of marks. But this is a defective method. Obviously, the child of 12 years is more intelligent than the child of 14 years in this illustration. Similarly, a child may be more industrious but comparatively dull and may score more marks than another child, who may in fact be more intelligent but less industrious.

Some important areas in which intelligence tests may be employed are given here.

I. Selection of students to a school: In good schools, there is always a rush for admission. All applicants, though eligible for admission, cannot be admitted. Intelligence tests help to meet out this difficulty.

II. Classification of pupils: Intelligence tests help us to make a sifting at the time of first admission to school at the age of four or five. Secondary education is the next stage where another check can be provided.

III. Detection of superior and inferior intelligence: Some pupils have superior intelligence than others. They move at different rates of performances and cannot be given instruction together. Many methods have been suggested to give instruction to the superior. While some favour complete segregation of the superior or more intelligent ones, others suggest that they should be taught along with the average and an enriched course of study should be prescribed for them. To quote Prof. R R Kumria, "If on the other hand gems of purest ray serene are allowed to be unfathomable caves, the blame of this criminal neglect lies at the door of the parents and teachers who are making the future generation—they should pick and choose the vanguard and the rearguard of the nation. Tarring all with the same brush is not only a psychological absurdity but a political blunder." Dr Rice's classification of the IQ of the Indians is given in Table 8.

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Table 8: IQ Classification by Dr Rice

Classification	Punjabi IQ
Genius	165 and up
Very superior	140–165
Superior	120–140
Average	85–120
Dull	70–85
Border line	55–70
Feeble-minded	Below 55

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IV. Selection of Courses: Different subjects require different degrees of intelligence. Some call for a higher level of intelligence and the others of a low. A nation-wide study conducted in the United States gave Median IQ of the High School boys in different courses (Table 9).

Table 9: Median IQ of the High School Boys

Courses	Median IQ
Technical	114
Scientific	108
Academic	106
Commerce	104
Trade	92

Burt found the following correlation between:

Intelligence and composition	0.63
Intelligence and reading	0.56
Intelligence and arithmetic (Problems)	0.55
Intelligence and spelling	0.52
Intelligence and writing	0.21
Intelligence and hand work	0.18
Intelligence and drawing	0.15

This means that children of high IQ are superior in the linguistic and abstract subjects—composition, reading, arithmetic and spelling.

V. Selection of suitable occupations: Burt drew up the following provisional scheme for occupational classification according to the degree of intelligence they require the following:

Higher professional and administrative work — (IQ 150). Lawyer, physician, architect, teacher (university and secondary).

Lower professional, technical and executive work — (IQ 130 to 150).

Clerical and highly skilled work — (IQ 115 to 130). Shorthand typist, bank clerk, salesman, electrician, nurse.

Skilled work — (IQ 100 to 115). Tailor, dressmaker, carpenter, cashier, printer.

Semi-skilled repetition work — (IQ 85 to 100). Barber, welder, minor, painter, baker.

Unskilled repetition work — (IQ 70 to 85). Manual labour, packer.

Casual labour — (IQ 50 to 70). Simplest routine work.

Institutional — (IQ under 50). Unemployable.

VI. Award of scholarships: Various public scholarships are awarded on the basis of the results secured through intelligence tests.

VII. Determination of the optimum level of work: The intelligence tests help to measure the student's capacity to succeed in his school work and enable the teachers to make an estimate of the mental level at which the student can be expected to work most efficiently in academic subjects. IQ is a rough index of the probable learning capacity of the various members of the class. With the aid of this test, the teacher finds it easy to adjust his methods in order to meet the needs of the individual.

VIII. Assessment of teacher's work: When the achievement of pupils in a subject does not correspond to the scores of their intelligence tests, it gives indication that the subject has not been taught properly by the teacher and understood by the student.

IX. The discovery of unusual cases: The lack of intelligence may be the main cause of abnormal behaviour. The intelligence tests, thus, help to find other cases of abnormal behaviour.

X. Intelligence and success in college: Gates and others were of the view that IQ of at least 120 is needed to do acceptable college work in a first college with an average expenditure of time and energy.

XI. Help in Diagnosis of backwardness: Ordinary scholastic examinations fail to discover 'educable abilities'. The failure of a child in the examination is no indication that he lacks intelligence. This failure may be due to defective methods of teaching or it may be due to some temperamental or physical obstacles which might have stood in the way of the child. There may not be any fault with the intelligence of the child, only it has not been allowed to work itself out.

XII. Evaluation of methods and materials of instruction: Intelligence tests are helpful in evaluating the results of the experiments conducted by a school in the

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relative importance of the different methods of instruction, i.e., achievement obtained with different textbooks or with a certain textbook as in comparison to extensive reading material obtained from not any one book but many.

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Limitations of the Intelligence Tests

It would be a great mistake to think that these tests are without any limitations. Intelligence is not the only factor which determines the success of a man for the journey of his life.

The first limitation of such tests is that they seek to measure intelligence which in itself is not a clear conception to the psychologists and on which they differ among themselves

Secondly, intelligence is not the only factor which plays a significant role in the success or failure of a man in a particular vocation. The intelligence tests fail to measure the depth, strength and qualities of a man pertaining to his emotional stability. They also fail to measure his ethical, social and aesthetic qualities which play a significant part in the life of an individual.

Thirdly, intelligence tests fail to take into account the environmental factors and the educational factors many a time and thus give misleading results. These tests may include material with which children of certain socio-economic groups have had more experience than those of other groups.

Precautions to be Taken

While interpreting test results, the teacher, should take certain precautions, namely:

1. General intelligence test, especially the group test, measures ability to work with abstract ideas and their relationships. This is just one type of ability. Thus, a child who scores low on this test can do well or very well on other practical activities. Children with low intelligence level should, therefore, be encouraged to develop and strengthen their special practical skills.
2. Verbal group test of intelligence is sufficiently dependent upon reading. So, a low test score should be interpreted very carefully for a poor reader. Such a child should be tested on an individual test, as well as on a non-verbal test.
3. Test results for socially disadvantaged children should be interpreted with caution.
4. The test interpreter should always keep in mind the standard error of measurement and take this into account while interpreting the test result.
5. Intelligence tests do not take in to consideration interests, attitudes and motives.

Intelligence Testing in India (A Short List of Early Tests)

Psychology Practical - I

Verbal Individual Tests

1. **Dr. C H Rice's Hindustani Tests:** Forman Christian College, Lahore was one of the first to start this work in India in 1921. This is an adaption of the Binet scale, in Urdu. These were published by Oxford University Press in 1929.
2. **Dr. Kamat's Age Scale Revision Tests:** In 1935, Dr. V V Kamat of Belgaum Training College, followed up the Binet-Simon system with the Stanford Revision and adapted it in the age scale for Indian children knowing Kannada and Marathi languages.
3. **Stanford Hindustani Revision** by Patna Training College, Patna.
4. **Allahabad Intelligence Test** for 11 year olds and above (in Hindi), by Dr. Sohan Lal, published by Kitabistan, Allahabad.
5. **CIE (Central Institute of Education) Test of Intelligence** by Shri Udai Shanker, Central Institute of Education, Delhi, 1953.

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Verbal Group Tests

1. Dr. J Morays Test, 1927.
2. Pasrur Group Intelligence Test (Urdu) by Prof. R R Kumria, Central Training College, Lahore.
3. Group Test of Intelligence (Test No. 12), Bureau of Psychology, Allahabad.
4. Sohan Lal's Test, 1946.
5. Samuhik Manasik Yogyata Pariksha by Prof. S Jalota, Banaras Hindu University, 1951.
6. Buddhi-Mapak Pariksha by V G Jhingram, Dharam Samaj College, Aligarh, 1952. The test was prepared both in Hindi and Urdu scripts.
7. CIE Group Test of Intelligence by Prof. Udai Shankar, Central Institute of Education, Delhi, 1953.
8. Jha's Group Tests by Rai Bahadur Pandit Lajja Shankar Jha, the late Principal of Teachers' Training College, Banaras.

Non-Verbal Group Tests

1. Hindi adaptation of RAC Oliver's Test for East Africa by E A Menzel, Bistrampur (MP).
2. Non-Verbal Group Test by T C Vicary and M Draper, Union Christian Training College, Berhampore, Orissa.

Prominent Institutions and Organizations in the Field of Testing in India

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1. National Council of Educational Research and Training (NCERT), New Delhi.

Types of tests developed by NCERT are broadly classified here:

- (a) Mental ability tests.
 - (b) Standard achievement tests.
 - (c) General aptitude tests.
 - (d) Teacher-made achievement tests.
 - (e) Special aptitude tests.
2. Department of Education, Delhi University / Central Institute of Education, University of Delhi.
 3. Departments of Education and Psychology of Indian universities.
 4. Agra Psychological Research Cell, Belanganj, Agra.
 5. Directorate of Psychological Research, Ministry of Defence, Government of India.
 6. State Institutes of Education, State Bureaus of Educational and Vocational Guidance.

IQ of Some Famous People

The following names were assumed and estimated on the basis of different measures since IQ tests were not available. Though authenticity was not confirmed, it was still indicative of intelligence or superior intelligence.

John Stuart Mill: 1806–1873 (English economist and philosopher)	190
J W Von Goethe: 1749–1832 (German poet and dramatist)	185
S T Coleridge: 1772–1834 (English poet)	175
J Q Adams: 1767–1848 (6th US President)	165
Alfred Tennyson: 1850–1892 (English poet)	155
David Hume: 1711–1776 (Scottish philosopher and historian)	155
William Wordsworth: 1770-1850 (English poet)	150
Francis Bacon: 1561–1626 (English philosopher)	145
Thomas Jefferson: 1743–1826 (3rd US President)	145
John Milton: 1608–1674 (English poet)	145
Daniel Webster: 1782–1852 (American statesman and orator)	145

(No such study on famous Indians is readily available.)

6. PROBLEM-SOLVING

Decision making and problem solving is a core function of management because it is an integral part of all other managerial functions such as planning, organizing, directing and controlling. It is also an integral part of life because life cannot be managed without making decisions. We are always faced with situations where we have to make choices almost every day of our lives and making a choice out of many constitutes a decision. This decision may be a simple one such as choosing clothes to wear, selecting food from a menu or deciding general activities for the day or it may be a major decision such as changing a job or purchasing a house.

Rational decision making and problem solving may be used interchangeably since a problem has to exist and a decision is made to solve such a problem. While most decisions indeed involve a problem, some decisions are comparatively routine and may not involve a problem. For example, decisions as to what to wear or which movie to see or whether to stay or go swimming are routine decisions and simple choices among available alternatives requiring common sense and simple qualitative judgement. Problem solving on the other hand is a much more vigorous process which requires rational inquiry based upon unemotional reasoning requiring identifying the problem, generating feasible solutions for it, choosing the best solution from utility point of view and then applying this solution to see if it works efficiently and effectively. In general, while decision making results in a choice from many alternative courses of action, the problem solving results in resolving the disparities between the desired performance and the performance that is actually obtained.

Decision making really is a complex mental exercise. Some of the decisions we make are highly significant with highly important consequences. The more significant decisions very often need the exercise of considerable analytical judgement and the quality of such judgement is the backbone of successful decisions. These judgements must eliminate the root causes of the problems that have necessitated such decisions. Ineffective decisions attack only the symptoms and are only cosmetic in nature. They may solve the problem on the surface or on a short run basis, but in order to find a lasting solution, the problem must be attacked at its roots.

As we all face the future, its unpredictability brings to us certain situations which are unexpected and hence problematic in nature. As we grow older and share added responsibilities, we develop certain characteristics which give us some intuitional senses which help us solve some of these problems and we also learn some techniques and methodologies through the acquisition of knowledge and skills which assist us in solving certain types of problems. These problems which require decisions exist at personal level, organizational level and at societal level.

Individuals must make major decisions regarding their careers, their marriage and family and other decisions which have far reaching personal implications. The organizational decisions involve problems relating to investments,

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products, marketing, location of production or service facilities, dealing with personnel problems, contributions towards community welfare and so on. Societies, in general, have many problems that affect their very survival such as crime, energy shortages, depletion of finite resources, health services, employment, political conflicts among nations and so on.

All these problems have to be faced and solved. No person can avoid problems and ignoring a problem is never a solution. As Thomas J. Watson Jr put it:

“I never varied from the managerial rule that the worst possible thing we could do would be to lie dead in the water with any problem. Solve it, solve it quickly, solve it right or wrong. If you solved it wrong, it would come back and slap you on the face and then you could solve it right. Doing nothing is a comfortable alternative because it is without immediate risk, but it is an absolutely fatal way to manage a business.”

From organizational point of view, the decision making process is such an integral and important part of management that some management thinkers propose that management is simply a decision making process. They call it the “decision theory school of management.” The basic emphasis of this school is not on people or environmental variables influencing the management behaviour but on the process of decision making and the theory that all management thought can be built around it. According to Simon⁽²⁾:

“A theory of administration should be concerned with the process of decision as well as with the process of action. Even if the decision making is not the only skill required for effective management, it cannot be denied that in fact it is an essential and highly important skill. This skill is actively utilized in all other functions of management such as planning, organizing, directing and controlling. Hence, decision making is widely acknowledged as the center of executive activity in business and industry and is considered as the major criterion for the evaluation of an executive’s administrative performance.”

Defining a Problem

Since a problem must exist in order to make a decision in solving it, we must know what the problem is so that we can identify it when it shows up. Being aware of the problem is the first pre-requisite for finding a solution. The Webster’s Dictionary⁽³⁾ defines a problem as, “a question raised for inquiry, consideration or solution.” While this definition is not complete or self explanatory in itself, a problem seems to exist when the symptoms of the outcome of an activity do not seem to be conforming with the expected outcome of the same activity as planned. For example, if you are going to your office in the car and on the way, you get a flat tire, then you have a problem since you did not expect this to happen. Similarly, if some one becomes ill, then this is a deviation from the norm of healthy living and this would constitute a problem and the sick person would seek a solution to the problem by going to the doctor.

The Structure of Problems

According to Harvey G. Brightman, the problems may be of the following types:

- 1. Ill-structured versus well-structured problems:** The ill-structured problems are unique, unpredicted and unprecedented situations. These problems are ambiguous and poorly understood and defy any cut-and-dry solution. These are generally “one-shot” occurrences for which standard responses are not available and hence require a creative process of problem solving which is specifically tailored to meet the requirements of the situation at hand. Such problems may involve closing of a plant, buying or merging into new company, starting a new business and so on. Because the ill-structured problems do not have well structured solutions, such solutions generally rely upon skill, intuition, creativity, experience and considered judgement and carry with them consequences of diverse ramifications. These problems are generally faced by top level management because their environment is complex and is involved with high level policy decision.

Well-structured problems, on the other hand, are clearly defined, routine, repetitive and respond to standardized responses. They are familiar, complete and easily defined and analyzed. These problems are generally faced by lower level and middle level managers who have, at their disposal a set of rules, policies and procedures that can be used to solve these problems so that such problems do not have to be referred to superiors for solutions. For example, if a professor cuts too many classes, the chairperson of the department can use the prescribed rules to discipline him and the issue does not have to be referred to the president of the college. Similarly, if you buy some merchandise and it turns out to be defective, you can take it back for a refund and for the management of the company, this problem of making refunds for defective merchandise is a well structured one because the management has already established a set of rules and procedures to deal with such a situation.

- 2. Operating level versus strategic level problems:** Operating level problems are generally well structured problems encountered by the organization on a daily routine basis. For example, a newspaper shop owner has the problem of reordering the newspapers and magazines every day and he knows when to order and how much to order. Similarly, daily or weekly production levels, inventory levels or sales levels are set and known and standard solutions exist to solve any problems in these areas when they arise. These situations are not new or unique and do not involve any changes in organizational policies or procedures.

On the other hand, strategic level problems are unique and demand high level management attention. These problems may involve changes in policies and are important in terms of actions taken or resources committed. While operating level problems do not affect the survival of the organization,

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strategic level problems do. Sometimes, if the operating level problems are left unattended, they may become strategic level problems. For example, if no action is taken against a professor who habitually cuts classes, this may affect other professors thus making it a morale problem for the college, which then would be considered a strategic level problem.

3. Crisis versus opportunity problems: The crisis problems develop suddenly and are totally unexpected at a given time. These may develop within the general framework of expectations so that the management has some types of preparations to handle these crisis situations. For example, a forest fire will create a crisis problem but the government and the community is generally prepared to fight the forest fire. Similarly, a major strike at the plant may not have been expected, but the management generally has made provisions to handle the situation.

Solving crisis problems is reactive in nature and requires reacting quickly and aggressively to solve the problem. It may be achieved through task forces which may try to mould crisis situations into well known problems for which the solutions are known to exist.

The opportunity problems are more of challenges which must be exploited for the betterment of the organization, rather than actual problems as per their strict definition, For example, if an opportunity to merge with another company arises which could be highly beneficial to a given organization, then such organization may not recognize the potential and may miss the opportunity, thus making the decision of not merging, a failure. Similarly, a slightly increased rate of employee absenteeism may mean some deeper organizational internal environmental problem and if the management does not recognize this opportunity to deal with the problem, this missed opportunity may blow up into a crisis. Both the crisis problems as well as the opportunity problems are handled by the central management.

The Problem Pointers

First of all, how do we determine that there is a problem? Even if we know that there is a problem, how do we determine the extent and the seriousness of the problem? According to Miller and Starr⁽⁵⁾, there are certain characteristics that are attributes of problems. One of the major characteristics of the problem is the existence of deviation between what was expected under a given set of conditions and what actually happened.

Before solutions can be found, the problems must be thoroughly and correctly diagnosed and the decisions concerning solutions to the problems must deal with underlying factors rather than surface symptoms. For example, a doctor prescribing a medicine for a headache as a symptom without looking into the root cause of it, will only provide a temporary relief and not really “solve” the problem, Accordingly, in properly defining a problem, we must ask some critical questions relating to it. Some of these critical questions may be :

- What type of problem is it?
- How large is the deviation from the norm?
- How quickly has this deviation been observed?
- What are the critical factors relating to the problem?
- Why do we want to solve this problem and when?
- Would the cost of solving the problem be justified?
- Who should solve the problem and what particular method be chosen to solve the problem?

These initial questions would indicate the extent of the problem so that we can become fully aware of it and grasp its significance.

It is very important that the problem be diagnosed as early and correctly as possible. For example, cancer, when detected in earlier stages, may be cured, but in advanced stages it can be fatal. The early awareness of the problem is the first pre-requisite for dealing with it. However, sometimes we may not even know that there is a problem when in fact it exists until it is too late when we find out. Colon cancer, for example, does not have obvious symptoms for early detection so that the patient may not even know that he has it until in its advanced stage. At other times, we may be aware of the problem but may not consider it serious enough to find a solution until it becomes a crisis. Some problems may hit us when their severity can no longer be ignored. For example, too many lives lost in car collisions may require legislation about seat belts in cars in order to solve the problem of death and injury in car accidents. Similarly, the destruction brought about by typhoons and hurricanes may indicate the problem of inadequate early warning systems.

Another problem pointer is a built-in signal in the process of operations so that whenever there is a deviation from expected outcome, it gives out a signal. For example, the Internal Revenue Service computer will create and send a signal to alert an administrator if some tax deductions are excessive in a given tax form so that some action can be taken. Similarly, our organizational accounting system can be set up in such a manner that any changes in the cash flow or demand, increase in the cost per unit produced, excessive and delayed state of accounts receivables, excessive inventories at hand and so on will attract the manager's attention quickly for appropriate action.

Some problems are pointed out by third parties such as a user of a product or a consumer representative group. The problem of toxic wastes almost became a crisis when various consumer groups started pointing out the problem of the community health to the government agencies. Poloroid instant camera came into existence because of a "consumer complaint," when the consumer happened to be the daughter of the instant camera inventor, who wanted to look at the pictures

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taken right away. Thus, if a product is faulty, it can be brought to the attention of the manufacturer. The Federal Safety Commission and Food and Drug Administration in America test products to see if they conform to prescribed standards. If they do not, then there is a problem for which the solution must be found.

There are some problems that come to surface due to sheer idle curiosity. The problem may not be a real one but may be considered a problem if solving it leads to better outcomes. Such a problem is not really the deviation between what is actually happening and what is expected, but a deviation between what is actually happening and what is actually achievable. For example, when Fredrick Taylor applied scientific methods to production, the productivity improved tremendously so that there was really no problem in production except that the situation was made into a problem by asking, “can we do it better?”. Based upon this premise, some organizations are continuously involved in finding problems with existing methods in order to improve upon them.

In general, a problem exists whenever there is a difference between an actual situation and the desired situation. For example, if the total number of incoming students into a college suddenly goes down than what was expected, then this would pose a problem requiring administrative attention and solution.

7. CREATIVITY

In 1980, Guilford stated, “Of all the qualities that man possesses, those that contribute to his creative thinking have been most important for his well-being and his advancement.” Creativity is a very precious and unique quality in an individual that enables him to solve complicated problems in different walks of life. Newton propounded his theory of gravitation and laws of motion at a very young age. The genius of Galileo and Einstein was recognized at their young age. Therefore, the gift of creativity needs to be nurtured right from childhood and should be continued throughout adulthood.

As an eminent personality observed, “In every underdeveloped country, potential Einstein and Newton are herding cattle or breaking stones.” There is a great deal of truth in this statement as it indicates how human resources remain uncultivated in most of the developing or underdeveloped countries. The progress and prosperity of a nation depends on the development of creative potential of its people.

Torrance said, “Society is downright savage towards creative thinkers especially when they are young.” Suppression of the creativity of a child means learning disabilities, behaviour problems, dropouts and mental conflicts and above all, a loss to mankind.

Definition and Meaning of Creativity

Some of the important definitions given below illustrate the meaning of creativity:

1. According to J E Drevdahl, “Creativity is the capacity of a person to produce compositions, products or ideas which are essentially new or novel and previously unknown to the producer.”
2. According to Jung, “Creative people are either perceivers or judges. Mathematicians and scientists are most commonly judges while writers are perceivers. Perception is again either sense perception or intuitive perception. Most of the people are perceptive while very creative people are intuitive.”
3. C E Skinner wrote, “Creative thinking means that the predictions and/or inferences for the individual are new, original, ingenious and unusual. The creative thinker is one who explores new areas and makes new observation, new predictions, new inferences.”
4. R Stagner and T F Karwoski stated, “Creativity implies the production of a ‘totally or partially’ novel identity.”
5. Torrence defined creativity 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.”
6. Weisberg and Springer defined the creative mind as, “One in which a problem stimulus easily evolves material from various experimental areas.”
7. R C Wilson, J P Guilford and P R Christensen defined creativity as, “The creative process is any process by which something new is produced—an idea or an object including a new form of arrangement of old elements. The new creation must contribute to the solution of some problems.”
8. According to Zbigniew Pietrasinski, a Russian psychologist, “Creativity is an activity resulting in new products of a definite social value.”

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Evaluation of Definitions of Creativity

Definitions of creativity fall under four categories.

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

A workable definition of creativity could be as: Creativity is the ability or the capacity of a person to discover and explore new areas to create or produce a new idea, or theory or object including the re-arrangement or reshaping of what already exists.

Creativity and Divergent Thinking

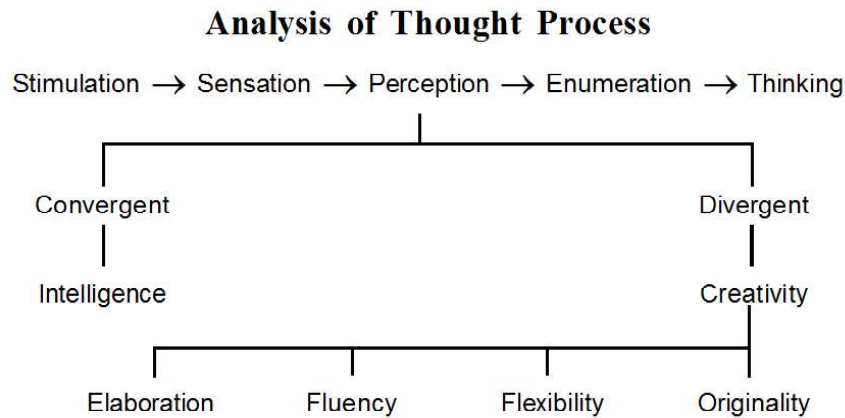
According to Guilford (1959), creative thinking means divergent thinking and uncreative thinking means convergent thinking. An example will make it clear.

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Suppose the teacher is teaching about forests. He may ask the students about the various benefits that we derive from forests. Here divergent thinking will be required. The teacher is not asking about any particular advantage but a variety of advantages. The students may think about a number of benefits.

In a lesson prepared for elementary classes, a child may be asked to perform different roles at different times i.e., role of a dwarf, role of a giant, role of a king, etc. All this would provide him with a scope to enhance his creativity.

The following representation will make clear the distinction between divergent thinking and convergent thinking.



Creativity and Intelligence

J P Guilford clearly distinguished between the intellectual operations of ‘divergent thinking’ (creative process) and ‘convergent thinking’ (which represents intelligence). According to him, every intelligent person may not be creative but a very high percentage of creative people possess a great degree of intelligence.

A large number of co-relational studies undertaken indicated that intelligence and creativity go hand in hand up to a certain limit and get separated after that limit. However, it is wrong to suppose that intelligence and creativity are two independent variables or that one always develops at the cost of other.

The findings suggest that while intelligence and creativity are positively correlated, the relation between the two is not entirely linear.

Difference in Achievement and Home Backgrounds of the Highly Intelligent and Highly Creative Students: Investigations by Gatzels Jackson on students of a private school in Chicago revealed that the two groups of children, i.e., the creative and the intelligent were equally superior in academic performance as measured by standard achievement tests. Highly creative students tended to come

from somewhat less well-educated homes and experienced greater independence from their mothers.

The essence of these differences may be summed up in one sentence. “The adolescent with high IQ may be seen as preferring the anxieties and delights of safety, and those with high creativity as preferring the anxieties and delights of growth.”

Creativity and Age

Lehman concluded on the basis of his studies that although some outstanding creative accomplishments appear at advanced ages, superior creativity generally rises rapidly to its highest or peak points in the thirties and declines slowly afterwards. Lehman also pointed out that apart from age there are numerous social, emotional and physical factors that retard creativity.

Creativity and Mental Abilities: Guilford mentioned the following mental abilities:

1. Fluency (the ability to produce large ideas).
2. Flexibility (the ability to produce a variety of ideas or approaches).
3. Originality (the ability to produce uncommon responses).
4. Redefinition (the ability to define or perceive in a way that is different from the usual).
5. Sensitivity to problems (the ability to evaluate implications).

Theories of Creativity

1. **Creativity as Divine Inspiration:** According to Plato, a creative writer is an agent of a super-power.
2. **Creativity as Madness:** Creativity is sometimes taken to be a sort of ‘emotional purgative’ that kept a man insane. Van Gough, the great master painter was said to be half-mad. Freud stated, “A neurotic is an artist san art.”
3. **Creativity and Intuitive Genius:** According to this viewpoint, a creative person intuits directly and immediately.
4. **Creativity as Association:** It is said that new ideas are manufactured from the older ones. Hence, more association leads to more ideas and more creativity.
5. **Gestalt Theory and Creativity:** Restructuring patterns or gestalts that are structurally deficient is called creativity.
6. **Psychoanalysis and Creativity:** According to Freud, creativity originates in a conflict within the unconscious mind. Creativity is a tension-reducing process.

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Creative Process

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Wilson, Guilford and Christensen observed that creative process is any process which produces something new—an object or an idea including a new form or arrangement of old elements. The new creation must contribute to the solution of some problem.

Torrance was of the view that the process of creativity is similar to the steps in scientific method. The central element of both is the production of something new.

Nature and Characteristics of Creativity

1. Creativity is the resultant of some interaction.
2. Creativity is the ability to synthesize ideas or objects.
3. Creativity is the ability to create new ideas, theories or objects.
4. Creativity is the ability to develop something original.
5. Creativity has several dimensions.
6. Creativity is a process as well as a product.
7. Creativity is a complex, dynamic and serious process.
8. Creativity knows no special medium, place, person or time.
9. Creativity is the capacity to accept challenges.
10. Creativity is the freedom to exercise choice.
11. Creativity is the readiness to change self and environment.

Creativity to Different Professions is Different

- To the **artist**, creativity is the ability to evoke an emotional mood.
- To the **architect**, creativity is the ability to evolve new approaches, forms and new materials.
- To the **scientist**, creativity is the ability to explore new way of extending knowledge.
- To the **teacher**, creativity is the ability to discover and apply dynamic methods of teaching-learning.
- To the **student**, creativity is the ability to use words and phrases in new situations, to solve sums speedily, to prepare new types of charts and projects, to write essays and stories depicting new ideas and so on.

Characteristics of a Creative Personality

Torrence compiled a list of 84 characteristics describing the traits of a creative personality. Some of these are the following:

1. Adventurous
2. Curious by nature
3. Desirous to excel
4. Flexible in his thinking, feeling and doing
5. Intuitive
6. Keen to explore and invent
7. Non-conformist
8. Self-disciplined
9. Visionary
10. Willing to take risk

Creative children are constantly probing, discovering, imagining, fantasizing, asking questions, guessing and wondering. Therefore, they should be encouraged to ask unusual questions, to explore new ways of thinking, to try novel approaches to problem-solving, to play with ideas and material and use divergent ways of dealing with traditional topics.

Role of the School and Teachers in Promoting Creativity in Children

School is, in fact, the proper place where an organized effort should be made to develop the basic foundations for creativity in children. Deliberate attempts need to be made to develop an environment of creativity among them. Some methods useful in promoting creativity are the follows:

I. Identification of the Creative Child: Both test and non-test techniques can be used to identify the creative child. Guilford and Merrifield developed test techniques that measured fluency, flexibility, originality, redefinition and sensitivity to problems.

Getzels and Jackson, on the other hand, used five different measures of creativity in their research.

- (a) **Word-Association Tests** — Students are required to give as many definitions and number of different categories into which they could be placed.
- (b) **Uses of Things Tests** — A student is asked to give as many uses as he can for a common object.

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- (c) **Hidden Shapes Tests** — A student is required to find more complex form of figures and shapes on cards, presented to him in a simple form.
- (d) **Three Different Endings** — A student is required to suggest three different endings to incomplete short fables.
- (e) **Make-up Problems** — A student is required to make-up or form as many mathematical problems he can on the basis of information given in a complex paragraph.

Besides these, the Minnesota tests of creative thinking comprising non-verbal tasks like picture construction, creative design, circles and squares, etc. and Torrence's check-list comprising 84 characteristics for identifying the creative children, are also very helpful.

II. Factors in the School that Hinder Creativity: The present curriculum and methods of teaching are rigid and tradition bound. The current educational system largely encourages acquisition of knowledge and lays emphasis on rote memory. It rarely calls upon children to think and use their creativity. Most of the school activities and curriculum are usually teacher-centred.

III. Strategies for Developing Creativity: It is often said that creativity needs to be identified, energized and guided almost from birth. Research findings suggest that the development of creativity cannot be left to chance. Creativity is likely to flourish in an environment which values independent and free thinking.

IV. Types of Programmes for the Education of Creative Children: Following are the programmes for educating and guiding creative children.

- (a) Identification of the creative children in the school.
- (b) Formulation of general and specific goals for guiding creative talent.
- (c) Providing appropriate learning environment.
- (d) Stimulating creativity among those children who do not apparently show it.

V. Providing Creative Learning Environment and Experiences in the Classroom: The teachers should follow the given guidelines to promote creativity in children.

- (i) Inspire the students to learn to disagree constructively.
- (ii) Inspire the students to emulate creative persons.
- (iii) Provide for exciting experiences to the students.

- (iv) Provide a safe, permissive and warm environment.
- (v) Develop student's ideas through constructive criticism and through referral to competent authorities.
- (vi) Provide necessary guidance and counselling for developing motivation and overcoming emotional fears.
- (vii) Allow the students ask unusual questions.
- (viii) Appreciate imaginative and unusual ideas of the students.
- (ix) Assure students that their ideas have values.
- (x) Evoke originality in thinking.
- (xi) Provide opportunities to students for self-initiated learning.
- (xii) Provide materials which develop imagination of the students.
- (xiii) Ask challenging and thoughtful questions.
- (xiv) Rewards rather than punishment helps to increase creativity in students or children.
- (xv) Shower love on them and let them know it.
- (xvi) Provide activities like drama, dance, music, etc.
- (xvii) Encourage debates, discussions, quiz, etc.
- (xviii) Show wit and humour in the class.
 - (ix) Encourage them to do intensive and extensive reading.
 - (xx) Arrange lectures of creative personalities.
 - (xxi) Encourage students for self-evaluation.
 - (xxii) Follow gaming technique.
 - (xxiii) Follow brain storming strategies.

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Brain Storming as a Strategy for Developing Creativity

It is a technique which emphasizes the importance of divergent thinking. It involves generating ideas in response to some problem in a group. It allows children to attack and solve a problem without any inhibition or restriction. Literally speaking, it is 'storming' a problem by a number of possible ideas and solutions.

To start with, students may be provided with a focus, i.e., a particular problem like 'Students' Self-government in the School', 'Checking Late Coming', 'Improvement in the Examination System', 'Organizing the Annual Function', etc. Thereafter, students are asked to suggest ideas. In this context, following guidelines need to be kept in view:

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- (i) Students are encouraged to suggest as many ideas as possible; however, unusual these might be.
- (ii) Students are allowed to express their ideas freely.
- (iii) Students' ideas should not be criticized.
- (iv) Students may be encouraged to build new ideas on the basis of ideas already suggested by the fellow students.
- (v) Main points of all the ideas should be written on the blackboard.
- (vi) In the end, attempts should be made to find out a meaningful solution.

Role of Home in the Promotion of Creativity

The home environment greatly influences the creativity aspect. Neither too much love nor too much fear promote creativity in children. Students should be permitted to ask questions freely. They should be provided with stimulating learning material. Appropriate toys and reading material may be made available to children.

8. ADJUSTMENT

According to James C Coleman, "Adjustment is the outcome of the individual's attempts to deal with stress and meet his needs; also, his efforts to maintain harmonious relationships with the environment."

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

B Vonhaller Geuner said, "We can think of adjustment as psychological survival in much the same way as biologists use the term adaptation to describe physiological survival."

L S Shaffer said, "Adjustment is the process by which living an organism maintains a balance between his needs and the circumstances that influence the satisfaction of these needs."

According to H C Smith, "A good adjustment is one which is both realistic and satisfying. At least in the long run, it reduces to a minimum the frustrations, the tensions and anxieties which a person must endure."

Traxler observed, "Occasionally, in the use of the term adjustment we imply that the most desirable state of adjustment is the one in which the individual is perfectly happy and satisfied with all aspects of his life and one in which he has reached the level in all his contacts with his environment that he would be glad to see persist through his life."

A perusal of the above definitions of adjustment leads us to the following characteristics of adjustment:

1. Adjustment helps us to keep balance between our needs and the capacity to meet these needs.
2. Adjustment implies changes in our thinking and way of life to the demands of the situation.
3. Adjustment gives us the ability and strength to bring desirable changes in the state of our environment.
4. Adjustment is physiological as well as psychological.
5. Adjustment is multidimensional.
6. Adjustment brings us happiness and contentment.

Therefore, a comprehensive definition of adjustment would be, “Adjustment is a condition or state in which one feels that one’s needs have been (or will be) fulfilled and one’s behaviour conforms to the needs of a given environment or the environment is changed (or will be changed) in a manner as it conforms to the needs of the individual.”

A Well-adjusted Individual: From above it may be inferred that an adjusted individual seems to be one who has established some reasonable goals in line with his interests and abilities and who has settled down to work towards those goals seriously and steadily but without tension.

Multidimensional Nature of Adjustment: The concept of adjustment was originally biological and was concerned with adaptation to physical environment for survival. Adaptation to physical environment is, of course, a person’s important concern, but he has also to adjust to social pressures and demands of socialization that are inherent in living interdependently with others. The demands from a person’s internal nature, his physiological needs like hunger, thirst, sleep, sex, elimination, etc., and psychological needs like self-esteem and self-actualization, influence the psychological functioning and adjustment of the person.

Complicated Process of Adjustment: The process of adjustment is complicated because a person’s interaction with one demand may come in conflict with the requirement of another. Conflict can arise either because two internal needs are in opposition, or because two external demands are incompatible with each other, or because an internal need opposes an external demand.

Conflict presents special problems of adjustment. Satisfaction of one need as opposed to other needs may not provide full satisfaction. On the other hand, failure to gratify a strong need or to respond to a strong external demand may

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result in painful tensions. These tensions can disturb psychological comfort, produce physical symptoms, or result in abnormal behaviour.

Adjustment as an Achievement and as a Process: Adjustment may be viewed from two angles. From one angle, adjustment may be viewed as an achievement or how well a person handles his conflicts and overcomes the resulting tension. From another angle, adjustment may be looked upon as a process or how a person adjusts to his conflicts. In the first case, we ask whether a person's adjustment is adequate and efficient. In the second case, we ask how does he adjust or what are the modes of adjustment to various demands.

Adjustment as a Psychological Process

Adjustment as a process is of major interest to psychologists who want to understand a person and his behaviour. The way one tries to adjust himself to his external environment, at any point of time, depends upon the interaction between the biological factors in growth and his social experiences.

In general, there are three broad types of adjustment processes in the event of a conflict between a person's internal needs and environmental demands:

- (a) The person may modify or inhibit the internal impulse.
- (b) The person may try to alter the environmental demand in some manner so that he resolves the conflict.
- (c) The person may 'escape' through unconscious resources to mental mechanisms like fantasy, compensation, projection, rationalization, sublimation, etc.

However, none of these modes of adjustments can be regarded as the most superior. Neither any one of them used in isolation, to the exclusion of others, is helpful in adjustment, nor the excessive use of one of them is likely to help in adjustment. Human beings in order to reconcile to their needs or the environmental demands must modify or inhibit their own impulses sometimes, alter or modify the environment at other times; and use some mental mechanisms at other times and at times a combination of all the three.

Areas of Balanced Adjustment

1. Good physical health.
2. Emotionally balanced, free from conflicts and frustrations.
3. Work efficiency or full use of one's occupational skills.

4. Socially acceptable behaviour such as obtaining sexual satisfaction through marriage.
5. Competence in interpersonal relations.
6. School adjustment.

Characteristics of a Well-adjusted Person

A well-adjusted person is expected to possess the following characteristics:

1. Adequate philosophy of life.
2. Awareness of one's assets and limitations.
3. Balanced level of aspiration—neither too high nor too low.
4. Satisfaction of basic needs.
5. Rational and appreciative attitude.
6. Flexible behaviour.
7. Strong will to face challenges.
8. Realistic perception of life.
9. Respect for self and others.
10. Warm and contented feeling with the environment.

Maladjustment in School

Maladjustment means the degree of disharmony between the individual and the environment. Maladjustment always results from frustration caused by the non-satisfaction of the needs. When we are unable to provide situations in the school which enable the child to satisfy his needs, maladjustment takes place.

In the words of Herbert Sorenson, "A person is not in harmony with his work if it is too hard or too easy. If it is too hard or if the student has too little capacity, excessive failure is experienced. If it is too easy or if the student has too high ability for his work, the work is dull and dreading."

An Adjusted Child

An adjusted and normal child is one who attacks problems directly, accepts and tolerates normal amount of frustration, acts rationally, makes sincere efforts to reach his goal, enjoys company of others, is cheerful and energetic and possesses an optimistic view of life and things around him.

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Symptoms of Maladjustment

The Committee on Maladjusted Children (UK) headed by J E A Underwood, in its report in 1955 listed the following symptoms:

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1. **Nervous Disorders:** Fears—anxiety, phobias, timidity, over sensitivity
Withdrawal—unsociability, solitariness
Depression—brooding, melancholy periods
Apathy—lethargy, unresponsiveness, no interests
Obsessions—rituals and compulsions
Hysterical fits—loss of memory
2. **Habit Disorders:** Speech—Stammering, speech defects
Sleep—night terrors, sleep walking or talking
Movement—twitching, rocking, head-banging, nail-biting
Feeding—food fads, vomiting, indiscriminate eating
Excretion—incontinence of urine and faeces
Nervous pain and paralysis—headache, etc.
Physical symptoms—asthma and other allergic conditions
3. **Behaviour Disorders:** Unmanageable—defiance, disobedience, refusal to go to school or work.
Aggressiveness—bullying, destructiveness, cruelty
Behaviour—jealous, demands for attention, begging and stealing, lying
Truancy—wandering, staying out late
Sex difficulties—masturbation, sex play, homo-sexuality
4. **Organic Disorders:** Conditions following head injuries, encephalitis or central tumours, epilepsy, chorea
5. **Psychotic Behaviour:** Hallucinations, delusions, extreme withdrawal, violence
6. **Educational and Vocational Difficulties:** Lagging behind or falling back in educational and vocational activities because of dullness, unusual response to school discipline, inability to concentrate and inability to keep jobs.

Dimensions of Adjustment in School

Following are the important dimensions of adjustment in school.

1. Adjustment to academic, co-curricular and school routine
 2. Psychological adjustment.
 3. Adjustment to and within the self.
 4. Social adjustment.
1. Adjustment to Academic, Co-curricular and School Routine
 - (i) Getting most out of specific studies and activities.
 - (ii) Overcoming learning problems and instructional difficulties.
 - (iii) Satisfactory progress in exploratory experiences.
 - (iv) Optimum relationships between classroom objectives and individual outcomes.
 - (v) Choice of appropriate courses in accordance with 3 A's: age, ability and aptitude.
 2. Psychological Adjustment
 - (i) Development of a good memory.
 - (ii) Development of desirable interests.
 - (iii) Development of a good temperament.
 - (iv) Development of desirable attitudes.
 3. Adjustment to and within the Self
 - (a) Self-understanding and acceptance.
 - (b) Proper insight into needs, attitudes and values.
 - (c) Overcoming emotional difficulties.
 - (d) Maintenance of health and personal hygiene.
 4. Social Adjustment
 - (i) Harmonious relationships with pupils and teachers.
 - (ii) Getting along with the members of the opposite sex.
 - (iii) Feeling socially acceptable.
 - (iv) Proper understanding of social needs and requirements.
 - (v) Understanding group goals.

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- (vi) Meeting effectively social requirements of the home, peer groups, culture and the community.

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Adjustment Processes or Mechanisms

Adjustment mechanism is a method or means used by the individual to achieve satisfaction of his needs indirectly. This helps in reducing tensions and assists him in maintaining self-respect. Such mechanisms are desirable and very helpful in dealing with frustration. Carried to extreme, they lead to behavioural disorders. Following are some of these mechanisms:

- (a) **Compensation:** Compensation is a concept where the individual attempts to cover up his weakness in one area by exhibiting strength in another. A student deficient in physical activity may compensate himself in showing good results in academic field and vice versa.
- (b) **Identification:** Identification is a concept when an individual attempts to identify himself with some successful person. To hide his own failures, a student may identify himself with his father and talk about his success.
- (c) **Rationalization:** Rationalization means shifting of responsibility of failures to outside factors, i.e., many students attribute their failure to the difficult question paper.
- (d) **Projection:** This is a tendency to 'push out' on another person one's own unrealized, frustrated ambitions, or attribute to another one's own faults. For example, school learners are often the victims of their parents' projection of their former hopes for higher education and higher social status.
- (e) **Day-dreaming:** Imaginative fulfilment of needs is called day-dreaming. It provides mental relief to an individual if it is done within limits. Carried to extremes, it becomes harmful.

Adjustment Programme in the School

1. Achievement testing, interpretation and follow-up.
2. Diagnostic testing, interpretation and follow-up.
3. Identification and analysis of adjustment problems.
4. Providing suitable educational and other experiences in accord with individual needs and capacities.
5. Use of a variety of instructional methods.
6. Individual and group remedial work.

7. Evaluation and coordination of classroom reports, anecdotal records, etc.
8. Student participation in school management.
9. Individual interviewing and counselling.
10. Organization of a rich co-curricular programme.
11. Communication of educational and occupational information.
12. Parents' cooperation and education.
13. School-community coordination.

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Role of the Classroom Teacher in Pupil Adjustment

The classroom teacher plays the most strategic role in influencing the environment to bring about an improved adjustment of pupils. Raymond N Hatch and Buford Steffle described the role of the classroom teacher in providing a healthy classroom environment that would complement the adjustment process of each pupil as under:

1. Provides a classroom climate that permits young people to feel free to express themselves and to put forth their best efforts as individuals and as members of groups.
2. Develops a youngster's self-respect and self-esteem by compliments for the work well done by a smile or a word of recognition.
3. Has an appreciation that deviation from acceptable behaviour is caused due to factors that stem from the school, home and his community.
4. Recognizes that a student who 'causes no trouble', may be experiencing serious emotional conflicts.
5. Recognizes that persistent behaviour cases may be sent to specialists for diagnosis and treatment.
6. Accepts that every pupil is different, and because he is different, he will achieve in accordance with his needs.
7. Develops comprehensive cumulative records by collecting sociometric information, autobiographies and similar information through classroom setting.
8. Practises good mental health.
9. Participates and contributes to the effectiveness of case conferences.

Teacher's Self-adjustment

The integrative behaviour of the teacher should be satisfying to him as well as to his students and it tends to bring about integrative behaviour in the children. The

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democratic and receptive behaviour of the teacher leads to better emotional rapport in the class and develops positive attitudes in the students towards the teacher and the class work. The dominative behaviour of the teacher creates resistance in the children. A well-adjusted teacher is capable of showing mature attitudes towards the pupils' immature behaviour. In this context Freud observed, "I hold ... that the teacher ... should have learnt to know and control conflicts before his educational work."

Frustration

For understanding the concept of frustration, following definitions will be useful.

1. According to H A Carroll, "Frustration is the condition of being thwarted in the satisfaction of a motive."
2. Carter V Good observed, "Frustration means emotional tension resulting from the blocking of a desire."
3. Kartz, Bamev and C F Lehner said, "Frustration refers to failure to satisfy a basic need because of either condition in the individual or external obstacles."
4. Walter B Kolesnie defined, "Frustration is the feeling of being blocked or thwarted in satisfying a need or attaining a goal that individual perceives as significant."

Above-mentioned definitions reveal the following characteristics and meaning of frustration.

1. Frustration occurs when a goal is blocked.
2. Frustration lies both in the individual and his environment.
3. Frustration results in mental tension.
4. Frustration is that stage or condition in which failure dominates the attempt.
5. The intensity of frustration depends upon the significance of the goal and the strength of the blockade.

Causes of Frustration

Causes of frustration may be divided into two heads: Internal and External.

Internal Causes: These include physical abnormality or defects, conflicting aims and desires, high ideals and morality of the individual, too high level of aspiration, lack of persistence and lack of sincerity.

External Factors: These consist of (i) Natural calamities, (ii) Economic and financial constraints, (iii) Corruption and favouritism, (iv) Absence of norms and domination of subjectivity.

Reactions to Frustration

A. Simple Reactions: These include: (i) Increasing efforts, (ii) Improving trials, (ii) Adopting compromising positions, (iv) Withdrawal from the situation, (v) Submissiveness.

B. Violent Reactions: (i) External aggression—quarrelling with colleagues and superiors, (ii) Internal aggression—hatred for the self sometimes may result in suicide. Thus, internal aggression is more dangerous than external aggression.

Conflicts

Definitions of a Conflict

1. O B Douglas and B F Holland observed, “Conflict means a painful emotional state which results from a tension between opposed and contradictory wishes.”
2. According to Katz, Barney and G F Lehner, “Psychological conflict is a state of tension brought by the presence in the individual of two or more opposing desires.”
3. L F Shaffer said, “Conflict may be defined as a state of affairs in which two or more incompatible behaviour trends are evoked that cannot be satisfied fully at the same time.”
4. Kurt Lewin defined, “Conflict is usually a clash of motives.”

From the above definitions, one can conclude that conflict is a painful condition or state of an individual. During this state, an individual feels intense emotional tension. Emotional tension results on account of the presence of two or more desires of the individual. These desires are contradictory in nature and it is not possible to satisfy these completely simultaneously. An individual who is not able to choose between these opposing two desires, becomes a victim of conflict.

Kurt Lewin stated that conflict arises as a result of interaction between the individual and his environment. Behaviour tendencies are represented by vectors which show the direction and strength of the individual’s striving. Most of the impulses can be described as directed towards or away from an event in the environment. This is described in terms of valences of which positive (+) valences are tendencies to approach and negative (–) are tendencies to withdraw and avoid. Valences and vectors are both field phenomenon and can be defined only in terms of both the character of the person and the forces of the environment acting on him.

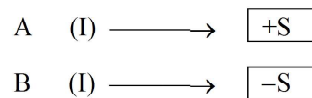


Fig. 16: Valences and Vectors

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In Fig. 16 in A, the interaction of the individual (I) and the situation (S) may be described as a positive valence; in B as a negative valence.

Types of Conflicts

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1. **Approach-Approach Conflict:** The conflict is between two positive valences — two equally attractive choices in strength. A child may have to choose between reading an interesting book and preparing a project. There is little danger in this type of conflict.
2. **Avoidance-Avoidance Conflict:** It is just like being caught between the devil and the deep sea. Conflict of this type is evoked by two negative valences. Both tendencies are to either retreat from or to avoid something. For example, a child who neither wants to study nor wants to displease his parents by not studying at the same time, may experience some conflict. Usually, conflicts of this type are more serious than the Approach-Approach type conflict.
3. **Approach-Avoidance Conflict:** In this type of conflict, approaching and avoidance tendencies are evoked simultaneously. For example, a child wants to play cricket but is afraid of being hurt. An adolescent, belonging to an orthodox family, is invited by a girl. He looks upon such an invitation with anxiety. On the other hand, he does not wish to look conservative and backward in the eyes of his friends and is also afraid of his parents. The first attracts him and the second frightens him. This type of conflict is the most difficult to solve. Approach-avoidance conflict often leads to inferior adjustment or unreduced anxiety.

Common Sources of Conflicts

1. **Family:** This includes: (i) Under-protection (ii) Parents' wrong handling of their children, (iii) Feeling of inferiority, (iv) Sibling rivalry, (v) Overprotection, (vi) Strict discipline, (vii) Parental submission, (viii) Unattractive children, (ix) Conflicts between parents, (x) Constant financial strain, (xi) Moral standards.
2. **Sex:** (i) Gap between physical and social maturity, (ii) Lack of manliness, (iii) Ugliness, (iv) Strict training in early childhood, (v) Guilt of masturbation, (vi) Clash of cultures, i.e., Indian or western, rural or urban, etc.
3. **School Conflicts:** (i) Over-competition or under-competition in the school, (ii) Over-restriction or under-restriction within the class (iii) Teacher's method of handling the class, (iv) Co-education, (v) Children with special problems of adjustment.

9. ATTITUDE

An attitude is an evaluation of an object or a person(s). It shapes our social perceptions and behaviour and it can be positive negative or neutral.

Attitudes are made up of several dimensions, which are bipolar in nature; for example, specific or general, strong or weak, simple or complex like religion, known or unknown, linked to action or unlinked to action, etc. Attitudes have the following three components:

- (i) **Affect:** The core involves affect, this is the emotional reaction to the object concerned. This can be described as the extent to which we like or dislike an object, for example, politicians, certain type of food, shoes, etc. In fact, all objects do trigger some kind of a positive or negative emotion. This is the feeling component of an attitude.
- (ii) **Cognition:** Attitudes also involve cognitions. These include the knowledge about the object, as well as beliefs, ideas, memories and images. For example, if we are positive about a particular player or team, we would gather a variety of knowledge about him/her or them and will remember a lot about them or their performances.
- (iii) **Behaviour:** The last component is behaviour. As a rule, when our attitudes are brought to mind, we are more likely to behave in accordance with the attitudes that we hold, rather than act inconsistently.

Current studies by Preston and Wall (2002) suggest that our attitudes activate regions in the brain that support specific actions. For example, when we see or smell a delicious food item, we prepare ourselves for action. Understanding all these is important to know attitudes and tackling the issue of attitude change.

Functions of Attitudes

Every attitude serves some purpose or the other. Simply, they motivate and guide behaviour. Besides this A.H. Eagly and S. Chaiken (1998) have identified four functions of an attitude that are as follows:

- (i) **Knowledge function:** This helps us to organize our understanding of the social world. This is the basis of how we attend to store, remember and retrieve information pertaining to a given object. This leads to better speed and efficiency in processing social information. This function also leads us to seek and selectively attend to information that supports our pre-existing attitudes. Self-evaluation also follows this function of attitudes. Prejudice also follows the same principle. Once attitudes have been acquired, they influence how information is gathered and processed.
- (ii) **Value expressive function:** Attitudes help us to express our cherished values. This is usually carried out in groups made up of people who reinforce and support the attitudes. For example, groups who play or watch cricket, fans of Michael Jackson, groups of particular political leanings, etc. Value expression occurs in the context of reference groups. Such groups are those whose opinions matter and affect our attitudes significantly. This function is inherently satisfying to the holder of a particular attitude. By expressing a

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value that is in agreement with the attitude held, people find a sense of joy and commitment to the opinions held. One is inclined to view people and groups holding similar attitudes more favourably. The type of college one joins, the subject of study one chooses, etc., also reflect the operation of the value expressive function of an attitude.

- (iii) Ego-defensive function of attitudes:** This function protects us from awareness of our own negative attributes and impulses, for example, our tendencies for aggression and sexuality. We do this by developing certain attitudes that help us view ourselves in accordance with our cherished view of ourselves. Deep down inside lurk our tendencies toward sexuality. We do not wish to acknowledge this to ourselves, because it is both frightening as well as socially unacceptable. This innate impulse is deflected on to socially less powerful groups, which perceives them to be immoral. So a prejudice attitude is developed towards the marginalized group. This leads to the phenomenon of stereotyping; for example, homosexuals are criminals.

The holding of a particular attitude help us save ourselves the acknowledgment of certain unpleasant truths about ourselves. The unpleasant truths are then perceived as typical of people belonging to a particular group in society. They are then seen as an undesirable section of society. By viewing this as the scum of society, we are able to spare ourselves the view of harbouring undesirable impulses within us. This is the ego-defensive function of an attitude; for example, we all know that accidents happen and that we or our dear ones could also suffer from it, but this is a frightening thought. Thus, our ego tries to spare us from this fear by developing an attitude which believes that road accident victims are careless road users. This attitude makes us feel relatively safe when we step on to the road. By this belief, our ego is protected from the fear of accidents and possible death on the roads.

- (iv) The utilitarian function of attitudes:** Attitudes sensitize and alert us to objects that are rewarding to us. These objects are then sought after. Other objects that are undesirable and to be avoided also figure in our attitudes. These are survival related, to begin with. For example, when there is a toxic atmosphere, we try to avoid it. But when there is clean fresh air, we wish to stay longer. Similarly, after eating sweet foods; one is naturally drawn to something that is salty to taste. These are beneficial to survival. Stimuli that are initially neutral, can be modified by pairing with objects that generate a positive or negative reaction. Example: consumer products are sold by pairing emotionally arousing pleasant sights, sounds, smells etc. with certain products. Also using animals, children, alluring women etc., have been found to be useful strategies for selling goods and services as compared to the use of neutral objects. Our attitudes are vital for daily living. They help us identify

rewarding and threatening objects. Attitudes are the reason why we choose to belong to certain groups. They protect from unpleasant realities. Attitudes act as powerful guides to our understanding of the social world.

Forming Attitudes

Attitude is considered to be the central theme in social psychology. Generally, it refers to an individual's evaluation about the social world; the extent to which people have favourable or unfavourable reactions to any issues, ideas, persons, social groups or objects. Attitude is one of the seriously researched topics in social psychology. The reason is that attitudes strongly influence human thoughts, feelings and behaviours. The evaluation an individual makes about his or her world is very important. It forms the basis of social cognition. Eagly and Chaiken (1998) suggest that social thoughts are slowly and steadily built by attitudes. Attitudes are learned. Some evidence suggests that attitudes may be influenced by genetic factors too.

For example, one individual may like vegetarianism another may like non-vegetarianism. One may have a positive approach to one political party, another may have a total negative approach to that party. Certain social psychologists notice that at times people take neither positive nor negative stand instead they take a middle stand, otherwise called ambivalent (J.R. Priester and R.E. Petty, 2001; M.M. Thompson, M.P. Zanna and D.W. Griffin, 1995). It is also an important point that people find it very difficult to change any attitude.

Social Learning

Attitudes are learned from society and this is why children do not show social discrimination. Social learning theory or SLT is the theory that suggests that people learn new behaviour through observational learning of the social factors in their environment. If people observe positive, desired outcomes in the observed behaviour, then they are more likely to model, imitate, and adopt the behaviour themselves.

Mechanisms for learning attitudes

By and large, socialization is the process by which attitudes are learned. This is the process by which a child becomes an adult member of a given society. Children learn attitudes from all those significant people around them. First, it is from parents (home), then from the school (teachers), then from friends, media and others.

Attitudes acquired from other persons

The processes underlying the learning of attitudes have been identified by psychologists and are as follows:

- (i) Classical conditioning
- (ii) Instrumental conditioning
- (iii) Modelling

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(i) Classical conditioning

Classical conditioning is learning by association. The principle involved here is that when one stimulus occurs first and this is then consecutively followed by another, then the appearance of the first becomes the signal that the second would also occur. Soon, the same reactions that have been occurring to the first stimulus would also occur to the second stimulus. This would be more so if the second stimulus by itself is capable of evoking strong reactions.

This process of classical conditioning can be seen as the basis for acquiring attitudes as well. Staats et al (1962) found that initially neutral words when paired with words or stimuli that tend to elicit strong negative reactions (like electric shocks or harsh words, etc.) acquire the capacity to elicit strong negative or unfavourable reactions.

Evaluations form the core of attitudes

Judgements or evaluations occur all the time during social interactions. In real-life conditions, the classical conditioning model can be seen to apply directly to the process of acquiring attitudes. For example, a child repeatedly sees the mother's frowning or avoiding members of a particular social group, each time she meets them. There are other signs of displeasure also that are displayed in this context. At first, the child is indifferent to the members of this group and shows no reactions. The child does not identify characteristics associated with this group (hair, clothing, language, etc.). However, as a result of the repeated pairing of this group and its members with the mother's negative reactions; the child now starts associating certain obvious characteristics with the members belonging to this group. Gradually, the child also comes to react negatively to these identifiable characteristics and thereafter to the group members, associated with these traits. This is the process by which attitudes are learned.

If members of a particular group are often isolated, despised and talked about negatively and the behaviour towards them are one of displeasure/avoidance, etc., and these are repeated then children and others would come to associate these negative thoughts and behaviour with the group in question. Soon the group and its members would be evaluated negatively. The child and the others have learnt to associate a specific group with certain characteristics, with negative or distinct responses. The group and its members are evaluated negatively. This completes the process of social learning of attitudes.

Since language is also part of the evaluation process and negative statements accompany negative reactions involving specific group members, the verbal responses are also acquired for description. Thus, both language and behaviour besides thoughts and feelings are also learned. So, all the three components of an attitude, thought, feeling and behaviour are learned through classical conditioning processes, involving association.

There is also evidence to suggest that this form of attitude learning occurs, even when people are not fully aware of the stimulus. Here, the explanation of acquiring negative attitudes is based on the unconscious association that occurs as a result of repeated pairing. When affect arousing stimuli are presented only for a very short duration, the recognition may not occur. The emotions, specially the negative ones, associated with the stimuli are aroused. So conditioning occurs even outside of conscious awareness. This has implications for the association between affect and cognition. That emotions are experienced even before the stimuli are properly recognized indicates that learning of the association between emotion and thought can be readily triggered by the affect, well ahead of the understanding of the stimuli or object that is creating the response.

Attitudes are aroused by emotions, even when the object of affect is not well recognized.

In terms of attitude learning, this means even before our object is recognized, the negative emotions associated with it are aroused; for example, the names of people belonging to a particular group could arouse negative emotions long before the members of the group are even encountered. This is known as subliminal conditioning. J.A. Krosnick (1992) and his colleagues indicate that even if subjects cannot identify or recognize certain stimuli adequately, yet the stimuli shape our attitudes. This is indeed a powerful process at work.

(ii) Instrumental conditioning

Studies on instrumental conditioning have been derived from the work of Bekhterev and Thorndike. Here, the subject's or person's behaviour is instrumental to the gaining of a reward or avoidance of punishment, therefore the name, instrumental conditioning. Since there is an operation involved it is also known as operant conditioning.

Consider an example, where a child hears the ice cream vendor and the child goes and buys the ice cream. Here, it is important to recognize that both types of learning get incorporated (classical and instrumental types of conditioning). In the first part, the child salivates to the sound of the ice-cream vendor's bell. This is the classical conditioning part of the learning. In the second half of the sequence, the child knows that reward would occur if certain responses are made, like going with the money and buying the ice-cream and then eating it. The first part is involuntary (salivation) the second part is voluntary. The first part is learned by classical conditioning and the second part by operant conditioning. This is known as the Two-factor theory of learning.

Procedural variations have been tried to establish different forms of control over a person's behaviour. E.L. Thorndike (1911) distinguished between satisfiers and annoyers or positive and negative reinforcers. A satisfying state of affair is one wherein a person does something to gain a reward or benefit. A negative or dissatisfying state is one wherein a person is motivated to avoid some situation.

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Four instrumental conditioning procedures have been proposed by Krosnick (1948), which are as follows:

- (i) **Reward training:** It is a type of box apparatus used for training. Here, a pigeon is presented with a light source and a key for pecking. The bird is rewarded with food for pecking the key as soon as the light appears.
- (ii) **Avoidance training:** Here, the subject can avoid any noxious stimulus by responding to a signal in a given manner. Bekheterev (1932) used conditioned withdrawal responses of hand or foot after being delivered an electric shock, by pressing on a bar or lifting a hand or foot, from a pedal or grid. Sometimes, turning off a noxious stimulus by operating a switch also constituted a form of avoidance training.
- (iii) **Omission training:** In this type of learning, a positive reinforcement occurs when a particular response fails to appear. In daily life the best known example would be one where food is given only when the dog does not jump on to the sofa or bed in a house. The training is to omit the dog's behaviour of jumping on to the bed/sofa.
- (iv) **Punishment training:** In this type of training a shock or any other form of punishment follows the occurrence of a specified response; for example, a child is rebuked or whacked for disobeying the adult command. This type of training is generally used for extinction of a given, undesirable response.

Shaping behaviour

Animals can be trained to perform tricks in a circus, dogs can be trained to sniff for drugs, children can be made to do complicated dance steps, etc. All these involve gradually molding the responses into a desired pattern. These are carried out by a process known as successive approximations. This means engaging in a series of steps of ever closely matched responses to the ultimate pattern of behaviour desired. For example, teaching a child to tie shoe-laces would involve the following steps:

- Step 1: Allow the child to slip into the shoes.
- Step 2: Then teach the simple knot to the child.
- Step 3: Let the child put on the shoes and tie the knot.
- Step 4: Get the child to perfect the knot.

Reward each step and get the desired behaviour. It may take time, but it can be achieved. Behavioural effects of various types of consequences is tabulated in Table 10.

Table 10 Behavioural Effects of Various Types of Consequences

	Consequence of making a response	Example	Effect on response probability
Positive reinforcement	Positive event begins	Food given	Increase
Negative reinforcement	Negative event ends	Pain stops	Increase
Punishment	Negative event begins	Pain begins	Decrease
Punishment (response cost)	Positive event ends	Food removed	Decrease
Non reinforcement	Nothing	—	Decrease

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Table 11 illustrates the comparison of classical and operant conditioning.

Table 11 Comparison of Classical and Operant Conditioning

	Classical conditioning	Operant conditioning
Nature of Responses	Involuntary, reflex	Spontaneous, voluntary
Reinforcement	Occurs before response (Conditioned stimulus paired with unconditioned stimulus)	Occurs after response (Response is followed by reinforcing stimulus or event)
Role of learner	Passive (Response is elicited by US)	Active (Response is emitted)
Nature of learning	Neutral stimulus becomes a CS through association with a US	Probability of making a response is altered by consequences that follow it.

(iii) Modelling

The third type of learning is modelling. A class watches the teacher draw a particular figure. Later, when the children are given paper and crayon they also try to draw a similar figure. Here, both observation and modelling are involved. In observational learning, watching and initiating the actions of others is the key to obtain the desired responses. Modelling is a process, in which information or behaviour is imparted by example, even before direct practice is allowed. So, the viewer merely gets to see and notice a particular action, with no practice involved.

A model is a person who serves as an example in observational learning, A. Bandura (1971). By observing a model a person may do the following:

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- (i) Learn new responses.
- (ii) Learn to carry out or avoid previously learned responses (depending on what happens to the model for doing or not doing the same thing).
- (iii) Learn a general rule that can be applied to various situations.

Certain conditions that must be present for observational learning to occur are as follows:

- (i) The learner must pay attention to the model and remember what was done; for example, a child watches Tendulkar hit the ball to all parts of the ground. He would attentively watch a few movements and strokes, but he cannot remember, all of them. So the learning is not complete.
- (ii) The learner must be able to reproduce the modelled response; for example, we may watch world class gymnasts, but may never be able to reproduce their movements.
- (iii) If the model displays a response and is rewarded for it, the learner is more likely to imitate that response/behaviour; for example, a hero's behaviour.

In other words, a model who is attractive, rewarded, admired, high in status, is likely to be imitated more than others, who are low in these features, Bandura and Walters (1963).

Finally, when a new response is tried, normal reinforcement determines whether the responses would be repeated thereafter.

Imitating models

Modelling has a powerful effect on behaviour. In a classic experiment, children saw a clip where an adult was shown attacking a blown up doll called BoBo–The Clown. All types of attacking acts were viewed. Later, the children who had viewed these clips were frustrated by having their favourite toys taken away from them. They were then presented with the BoBo doll. Most imitated the attacks that the clip showed to the doll. The children also punched, kicked and threw the doll, to express their anger. This showed that the children imitated the model in the film clip and displayed similar behaviours. Children do not blindly imitate models. Only those models who are rewarded provide them with an incentive for initiating.

Children imitate what parents do, more than what they say. Thus through modelling, children learn attitudes, gestures, behaviours and even fears and anxieties. Bad habits are also possibly learned through modelling. For example, use of foul language, beating, yelling, screaming, not getting up early, etc., are also learned from models in the home, school, peers and then the media. TV also acts as a model.

Televised violence has been found to have a significant impact on aggressive outbursts in children and adults. Parents and other sources serve as guides for passive formation of attitudes. Forming attitudes takes place through the following:

- (i) **Association:** Classical conditioning.
- (ii) **Reinforcement/punishment:** Instrumental conditioning; children and others are rewarded for holding and expressing certain attitudes and punished for wrong unacceptable ones.
- (iii) **Modelling:** We learn and base our behaviour and attitudes only by seeing and hearing others who are significant in our lives.

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Genetic Factors

Genetic factors can influence our height, eye colour, and physical characteristics, the idea that they might also play a role in our thinking seems strange, to say the least. In fact, a small but growing body of empirical evidence indicates that genetic factors may play some small role in attitudes (Arvey et al, 1989; Keller et al, 1992).

Most of this evidence involves comparisons between identical and non-identical twins. Because identical twins share the same genetic inheritance while non-identical twins do not, higher correlations between the attitudes of the identical twins would suggest that genetic factors play a role in shaping such attitudes. This is precisely what has been found; the attitudes of identical twins do correlate more highly than those of non-identical twins (Waller et al., 1990).

Attitude's influence on behaviour

Social psychologists came with lot of research evidences that attitudes influence human behaviour. For example, if one believes that a person is threatening, he may feel dislike and therefore act unfriendly with that person. It seems several factors determine the extent to which attitudes influence human behaviour. To say a few, the situation, features of the attitude and strength of the attitude decides the effect of influence on behaviour.

Attitudes, reasoned thought and behaviour

The first of these mechanisms seems to operate in situations where to give careful, deliberate thought to our attitudes and their implications for our behaviour. For example, in their theory of planned behaviour, Ajzen and Fishbein (1980) suggest that the best predictor of how to act in a given situations is the strength of our intentions with respect to that situation (Ajzen, 1987).

Perhaps, a specific example will help illustrate the eminently reasonable nature of this assertion. Suppose a student is considering body piercing, for instance,

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wearing a nose ornament. According to Ajzen and Fishbein, these are strongly influenced by three key factors.

The first factor is the person's attitude toward the behaviour in question. If the student really dislikes pain and resist the idea of someone sticking a needle through his nose, his intention to engage in such behaviour may be weak.

The second factor relates to the person's beliefs about how others will evaluate this behaviour (this factor is known as subjective norms). If the students think that others will approve of body piercing, his intention to perform it may be strengthened. If he believes that others will disapprove of it, his intention may be weakened.

Finally, intentions are also affected by perceived behavioural control—the extent to which a person perceives a behaviour as hard or easy to accomplish. If it is viewed as difficult, intentions are weaker than if it is viewed as easy to perform. Together, these factors influence intentions; and these, in turn, are the predictor of the individual's behaviour.

Direct Experience

Some attitudes are also learned and formed as a result of one's own experiences; for example, liking for a particular type of food, dislike for a group in society, fondness for a special type of music, etc., are all acquired on the basis of direct experiences with these situations. Attitudes formed by direct experience are generally stronger and are very resistant to change.

Attitudes formed through direct behavioural experience with an attitude object have been found to better predict later behaviour than attitudes formed through indirect experience. An experiment was conducted to test the hypothesis if an information processing difference exists between direct and indirect experience. Subjects watched a videotape of an individual who was working on a puzzle. The subjects were asked whether to empathize with that person or not. Taking the perspective of the person having the direct experience led 'empathy subjects' to behave more consistently with their own reported attitudes toward those puzzles than 'control subjects'. The results suggest that direct experience affects the attitude formation process by altering the way in which the available information is processed.

Attitude as heuristics

Attitudes act as heuristics. This shortcut helps us to reduce the information overload that we experience and facilitates decision-making. Attitudes help us simplify living; for example, by having a particular food preference, the choice of restaurants becomes very much easier, when planning to eat out.

10. PREJUDICE

Prejudice and discrimination are often used interchangeably in daily speech. Yet, they are different. Prejudice involves a negative attitude towards the members of some social group, merely because of their membership in that group; for example, old people, mentally challenged people, widows, etc. There is also an affective response involved in these negative attitudes. Discrimination is the unfair treatment of members of a given groups, because of their membership.

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Nature of Prejudice and Discrimination

The following are the nature of prejudice and discrimination:

- Prejudice is a negative attitude while discrimination is prejudice in action. When there is a possibility of punishment, then the prejudice does not always lead to discrimination; for example, caste based discrimination in public life is punishable and therefore held under control, but it operates in personal/ social life.
- Some of our attitudes are ambivalent; they contain negative and positive elements; for example, attitudes towards working women.
- Prejudice being a special type of attitude (generally negative) it operates as a schema. This is a cognitive framework for organizing, interpreting, storing and recalling information, Fiske and Taylor (1984). So, prejudiced individuals tend to notice, encode, store and remember certain kinds of information towards members of a particular group, that is consistent with their prejudiced orientation (Bodentausen and Wyer 1985).

Components of prejudice and discrimination

Prejudice as an attitude has three components. The cognitive component includes the beliefs and expectations about members of a given group, as well as the way in which information is processed. The affective component refers to the negative feelings experienced by prejudiced persons when they are in the presence of members of the despised group. Even the thought of this is sometimes enough to arouse negative emotions. The behavioural component involves the tendencies to act in negative ways against the members of this group. This constitutes discrimination.

As prejudice and discrimination are frowned upon in modern, civilized life, it has driven both these inclinations underground. Thus, subtle ways in which they manifest are noticeable. Prejudiced people wish to harm the targets of their prejudice without any cost or difficulties for themselves. So, they discriminate in subtle ways, while concealing their negative attitudes.

Three of these common forms of subtle discrimination are as follows:

(i) *Withholding aid from people:* Withholding aid from people who need it. For example, diverting development funds from the poor needy.

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(ii) *Engaging in tokenism:* This involves engaging in trivial acts of favour giving to members of a prejudiced group, so as to deny any major affirmative actions towards this group. For example, hire a person who is physically challenged for an innocuous job, so that others need not be considered for major employment. Promoting one woman to a managerial position, to silence critics about sexual gender discrimination, is a good example of tokenism.

(iii) *Reverse discrimination:* People, who fit into a particular category, are given favours; for example, teachers grade students of a special category, more favourably in school not only as a way of encouraging them, but also because the expectations from such categories of students are low. So, average students of a given category are rated more favourably as compared to average students of the general category, Fayardo (1985).

Acquisition of Prejudice

Prejudice is seen to exist in all societies since time immemorial. It is an ever present danger and a threat to any society as it is anti-development. Three perspectives can be used for understanding the origins of prejudice. They are as follows:

(i) *The economic perspective:* According to this view, groups develop prejudices about one another and discriminate against each other, when they compete for material resources. Religious groups, caste groups, regional groups, language groups, gender groups, elite groups, etc., all carry out activities to protect their own interests by attacking those who are seen as threats to their existence.

(ii) *Realistic-groups-conflict theory:* Levine and Campbell (1972) proposed that groups confront each other over real economic reasons. Resources of the earth are limited; for example, oil, gold, water, etc. People have to compete to access these valuable limited resources. When there is less to go around, people are afraid of losing what they have or wish to gain more, the competition intensifies. This theory also predicts that prejudice and discrimination are likely to be most among groups that stand to lose from another person's economic advancement. For example, working class Americans feeling most threatened by Indian techies. China showing territorial aggression in the Asian region. Ethnocentricity, religions intolerance, sexism are all manifestations of such realistic conflicts.

(iii) The robbers and cave study: An example of inter-group conflict in a summer camp for young children, 7–11 years of age. Sheriff et al. (1961) carried out an ingenious field study to understand the phenomenon and the process involved in group conflict in a real-life situation. The study consisted of two groups of boys who were to participate in a summer camp. They were screened for being typical of middle class America. They were taken to a distant place and no contact with family, friends, etc. was allowed. They were parked in the wilderness, and had no electricity and other basic amenities. They lived in tents. In the first phase of the experiment, all the boys engaged in camp activities like pitching tents, cooking and cleaning, besides playing games like basketball, swimming enacting skits and singing. The boys were divided into two groups. Soon each group developed cohesiveness, gave themselves the names Eagles and Rattlers and were all happy together.

In the second phase of the experiment, the two groups participated in a tournament. The winning team would receive medals and a prized camp possession—a pocket knife. The losing team would get nothing. The tournament involved baseball, tug-of-war, treasure hunt and such games. The groups were encouraged to compete as hard as they could.

As the tournament proceeded and the competition grew, the two groups were seen hurling names and abuses at each other. The beginnings of hostility were clear. From words, the hostilities descended to physical means. Fights in the dining areas were seen, raids into each other's cabins were frequent, etc.

The internal dynamics of the groups changed as the competitive struggle intensified. The members of their own group and their activities were perceived favourably, while those of the other group were perceived, negatively. In-group-out-group categorization had developed. The 'us-them' notions were clearly perceptible. In the two weeks of the camp, conflict arose and the group members showed strong prejudice towards the other because they were competing for coveted prizes.

In the final phase of the experiment, the researchers (Sherif et al) attempted to reduce the negative feelings and reactions. Merely increasing the amount of contact between the groups, failed to improve the negativity between the groups. So, a new condition was created. They were told that their only source of drinking water was poisoned by some forest animal. They all had to pitch in and work together to clean up the water source. Hectic joint activities followed for the next two days. Both the groups worked closely to reach the goal. Here, the attempt was to attain their common super ordinate goal of cleaning the water source. Soon, the hostilities that had developed

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over the two weeks due competition gave place to cooperation to achieve their common goal. Once the water supply was cleaned, the boys of the two groups found themselves feeling and behaving like comrades, all over again. The tensions between the groups disappeared and friendships were seen to develop across the groups. Many were seen watching games played by others, in a sporting manner. The hostilities were absent and fun and togetherness reappeared. The atmosphere was a happy and a non-conflict one.

This study demonstrated how competition for scarce resources can quickly lead to conflict and feelings of prejudice and thereafter give way to discrimination. Superordinate goals are those goals that transcend the interests of any single group and that which can be attained only, if the groups work together. This leads to focus on the common goal and the melting away of sub-group distinctions.

This economic perspective can be applied to see how intergroup relations in the world function. Teaching, research environmental causes, sports, culture, movies, etc., could be used for creating greater commonalities as a way of reducing hostilities. Mahatma Gandhi's need-based life is one of the alternative, for reducing competition.

Direct Intergroup Contact and Recategorization: The Motivational Perspective

People very readily divide the world into 'us' and 'them' categories; the group that one belongs to is the 'in-group'; while those who belong to the other group are called 'out-group'. Even in fairly homogeneous groups, seemingly arbitrary and meaningless criteria are used for creating such distinctions. The categories may be as minimal as place of residence, school, occupation, etc. Further, the 'us' group are viewed in favourable terms, while the 'them' group is seen in negative terms. So, they are disliked as they are seen as possessing undesirable traits.

Tayfel and Turner (1979) demonstrated this in their studies. Some of the members of the 'in-group' did not even agree to meet the others, even through the categorization appeared purely arbitrary. This suggests that prejudice may stem from our inherent tendency to categorize people into 'us' and 'them'. Why does this occur? Tayfel and others (1971) call this mentality an attempt to be a part of a group on the basis of bare-minimum characteristics; for example, those who work in the fourth floor, those who drive a car, as opposed to a bike and so on. Even when people do not know who the other members of one's group are, there is a distinct favouring of those who are of one's group, as compared to those outside the group.

This distinction once formed and the basis is a substantial one, then the consequences can be enormous and often disastrous. Religious intolerance is the

best example based on such a distinction. The 'us-them' categorization is a cognitive one. This helps us to organize the world around us in a quick and easy way. How does this distinction lead to favouring one's group and being negative to the other? For this motivational explanation is offered. Tayfel and Turner propose the social identity theory to explain this phenomenon. According to them, people desire their sense of identity not only from their own accomplishments, but also from those of the groups to which they belong; for example, people who studied in an Ivy League School in the US, people who belong to this political party, people who believe in democracy, etc. Individuals seek to enhance their self-esteem by identifying with specific social groups. This strategy would work only if their own group is seen as being better than the other group(s). Since all groups carry out the same process, the final result is one in which every group sees itself as superior to their rivals. Prejudice arises out of the conflict of social perceptions. To distinguish it from realistic-resource based completion, Tayfel calls this social completion. So, by boosting the status of one's group, one stands to elevate one's own self-identity.

Our group identity is raised by perceiving other groups as being lesser. Several studies have supported these suggestions. Meindel and Turner (1985) observed that the need to enhance our self-esteem would be greater, after recent failure experiences. This led to situations where the out-groups were perceived in extremely negative ways. For example, internationally weak countries perceive and evaluate the more strong and prosperous ones with a lot of contempt and disdain and speak about themselves in morally, religiously and culturally superior. These are the origins of racial, ethnic, religious and sexist prejudices.

Caldini et al. (1976) saw the tendency to identify with winning teams in sporting events, as a support for boosting the self. This is seen as basking in reflected glory. This is why the victorious describe themselves as 'we are the best', 'unbeatable' and so on. People buy T-shirts, mugs, caps, and other memorabilia, to identify with a group and feel good about themselves. While they rejoice in their group's achievements; they find denigration of the other group also satisfying. This is the prejudicial outcome of identification with one's group and their successes.

Frustration–aggression theory

One of the most common outcomes of frustration could be lashing out at objects of people in the vicinity. A frustrated motorist would honk more at other drivers on the road. Similarly, this principle suggests that when hardships exist in society, people are more prepared to display their prejudice and discrimination, than at moderate times. However, often it is not permissible to lash out at the real source of our frustrations. Here, we choose to displace our aggression on to suitable soft targets. For example, if we have a bad day at work we are likely to get angry at

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the smallest of things when we are back home. Kids, who are scolded by their teacher, take it out on their weaker siblings and so on. This claim is clearly visible. The frustration–aggression theory predicts that hardships in society could generate ill-will towards minority or less privileged groups in society; who by virtue of their weaker position, are perceived as safe and vulnerable targets. Lynching, rioting, sexual abuse of children, women, etc., are examples of activities carried out by the more powerful, but frustrated groups in society, against the weak. This is called scapegoating. Ethnic, religious and other barriers erected against foreigners in a country, is indicative of this phenomenon caused by frustration in one's own society. Many western countries find their workforce jobless due to outsourcing. India and China are viewed as job-stealers, by the developed countries.

The economic and motivational approaches give some explanations about the origins and unequal evaluations of the in-group and out-group as the basis for the development of prejudice and discrimination.

Cognitive Intervention Prejudice

We categorize everything. This serves the purpose of simplifying the world around us. Stereotypes help us in the categorization process.

Stereotypes conserve cognitive resources

Since the real world is far too big, unbelievably complex and also very transitory, it is not possible to know anything at all in sufficient detail to deal with things in any meaningful way. Hence, the human mind reconstructs it into a simpler model so that it is more manageable, Liffman (1922). Stereotypes enable us to engage with these small scale models. Macrae and Bodenhausen (2000) state that stereotypes are useful categories that help us process information efficiently. It is particularly useful when there is information overload, fatigue or distraction. Then the stereotype, shortcut come in very handy.

The downside of the use of stereotypes involves occasional inaccuracies and errors. It can lead to unfair and biased judgements as all people may not fit into a stereotype. The information that is processed on the basis of stereotypes, leads to enduring attitudes, even in the absence of validity for holding them. This results in prejudicial evaluations. Also, stereotypes can distort perceptions.

Biased information processing

It is important to examine the processing that occurs leading to inaccurate convictions about people belonging to different groups. Dovidio, Evans and Tyler (1986) found that data relevant to a particular stereotype are processed more quickly as compared to irrelevant information. This also implies that a person holding a stereotype pays attention to specific information, ignoring other information. These may be consistent

with the stereotypes held. If inconsistent information occurs, the attempt would be to reduce the discrepancy by recalling facts that are consistent with the existing stereotypes.

Stereotypes also determine that we remember and recall information that is consistent. Stereotypes support prejudicial evaluations by noticing information that is consistent with it. This result is the self-confirming of the stereotype. So exceptions make a person readily choose supporting information. Thus, the cognitive processing itself strengthens the presence and operation of stereotypes. They get confirmed by the selectivity of attention, storing, remembering and recalling. This firmly entrenches the prejudice.

Illusory correlation

This implies perceiving connections of relationship where none exist. This is an unfortunate cognitive process at work. When two distinct stimuli or events co-occur; they are perceived as correlated. For example, violent crimes and certain types of groups (migrant labourers) both these stimuli are distinct. These two categories are perceived as related to the crime. This is an instance of illusory correlation. Illusory correlation is an erroneous belief about a connection between events, characteristics or categories that are not related at all. It is the paired distinctiveness that stands out, because they co-occur, Hamilton Gifford (1976).

Negative events have distinct impact on our attention. If they are committed by certain distinct group members, like migrant labour, then the distinctiveness increases. Thus, it becomes doubly noteworthy. So these two characteristics and categories are seen as related. These twin cognitive flaws also lead to the development of stereotypes and prejudice.

Out-group homogeneity effect

We think of homosexuals, drug addicts religious fundamentalists, etc., as a unitary group. The image of these groups is that the members of this group think act and behave alike. Men and women also perceive each others as a homogeneous group. We perceive all out-group members as very much alike. This is indeed a serious bias in the perceptions, we hold. So out-group members are perceived and treated as representative of their group. In contrast, the in-group members are perceived to be different from each other. Each person has likes and dislikes, strengths, weaknesses, etc., and they are all clearly identified and perceived to exist. Out-group homogeneity is another type of bias, leading to prejudice.

Self-fulfilling prophecy

This means acting in a way that tends to support the original beliefs we hold. We behave towards certain group members in such a way that we almost elicit the

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types of behaviours that we expect from them. For example, teachers who believe that students belonging to certain groups have lowered intellectual capacities would inadvertently or consciously fail to provide good education. This in turn would lead to decreased scholastic performance. This result would confirm the belief that they hold about the given group and its members. Like the girl child in parts of India is perceived as a liability. So, the parents neglect her in terms of nutrition education, exposure, empowerment, etc. This leaves her inadequate in life. This outcome strengthens their existing belief that the girl/woman is less competent and need more subordination. This supports and strengthens the myth that men should dominate over women, otherwise women would die. Some even use religious beliefs to keep women oppressed. When the oppressed renders her helpless, this vulnerability is then used as the legitimate reason to subjugate women.

By behaving in ways that are bound to extract the kind of responses one is expecting and when these expectations are met, the belief system gets truly enhanced. So the proof for a belief is almost seen as being verified in reality-testing. Self-fulfilling prophecy perpetuates the rule of mistakes. This is yet another cognitive error in the continuation of prejudice. The cognitive resources that result in the emergence and maintenance of prejudices are based on stereotypes or beliefs. The processes identified are the 'us' versus 'them' categorization. Viewing the 'us' group favourably and the 'them' group negatively leads to negative feelings about the other group.

Prejudicial evaluations continue due to out-group homogeneity in perceptions. Biased information processing occurs, whereby selective attention, retention and recall of stereotypic information occur. Then there is the twin mechanism of illusory correlation and paired distinctiveness that connect and maintain relationships that do not exist, in an erroneous manner, leading to the prevalence of stereotypical views.

Finally, we have the self-fulfilling prophecy that regulates many behaviours that almost validate the belief held by the perceiver. These are the cognitive processes that explain how prejudices come about and are maintained, even in the face of contrary information. Prejudice also enhances the self in terms of a member, because they see their group as superior to the other group. Economic, motivational and cognitive processes give rise to prejudices and their continued maintenance in people.

Competing Prejudice and Prejudice Based on Gender

Prejudice is a deadly poison that affects society. It drains the resources of any group. It is negative and unhealthy. Several plans of action have been studied and suggested, some of them are as follows:

- **Learning not to hate or have a prejudice:** Since bigotry has been learned from parents, teachers, friends, media and other such significant sources, (classical, instrumental conditioning and modelling), it is possible to unlearn the prejudices through these techniques. Parents and teachers can be sensitized about their role in the development of prejudices and discrimination. This awareness could lead to discouraging their wards from learning prejudiced attitudes.

Teachers can provide opportunities for students to experience the unfair discriminations that can be faced if prejudice and discriminations are mounted on them, in role play situations.

Through these procedures, the chain of hate can be broken. The result could be an understanding of the evils of prejudice and discrimination and thereby a reduction in such behaviour and thinking.

- **Direct inter-group contact:** The presence of prejudice leads to segregation of people of both sides. The victims as well as the perpetrators. This separation could result in increasing the negative attitudes about each other. Since no social interactions exist between the two groups who are hostile to each other, neither gets to see the other in fair and non-prejudicial terms. Stephan (1985) proposed the contact hypothesis wherein the two group members could get better acquainted with the other and realize that they are similar to each other than was thought to be. People who are perceived to be similar are more likely to view each other favourably. Contact would also throw up inconsistent information on a regular basis. This could challenge the negative schema and change could arise. Direct contact would also lead to the destruction of the perception of out-group homogeneity. All these raise hope for attacking prejudices.

However, a few conditions of contact have to exist for prejudices to be lowered. They are as follows:

- o Contact must be between groups who are equal in terms of social, economic and task-related status. For example, similar vocations, incomes, education and other standing in society. Contact between owners of an industry and the employees are not on equal relationship. Here, contact would not help in prejudice reduction. If there is unequal status, the contact could lead to strengthening of the existing prejudicial attitudes.
- o Contact should involve cooperation and interdependence. These conditions would lead to the pursuit of shared goods. Hence, competition would ease and each group might be more favourably disposed to the other. This can foster change.

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- o The contact should occur on an informed note. This would make people shed their roles and expectations associated with it. This one-on-one interaction is ideal for breaking stereotypes and initiating changes.
- o The contact must happen in a setting where the group norm would favour equality and closer associations between the groups. For example, a sporting event, or a cultural meet.
- o The groups must consciously act in ways that disconfirm the stereotypes that are held by each other; for example, teachers can wear casual clothes and dance and display less rigidity, show more openness and friendliness besides engaging in activities that students, prefer (games, jokes, watching movies, going for picnics, etc. are suitable activities, for disconfirming prejudices).
- o Each person must view the member of the other group as typical representative of their respective groups. This would help in generalizing these pleasant contacts to other person and situations, also.

Cook (1985) found that prejudice between groups does get reduced if contact occurs in some or most of these conditions. In real life the cases of integrated schooling is an example of attempts at prejudice reduction, through direct contact. The concept of inclusive education also has this as the basis.

- **Mindfulness in thinking:** Since people are ‘cognitive misers’ in terms of processing information, we quickly categorize and allow the stereotypes to operate in thoughtless manner. This results in the maintaining of the existing prejudiced attitude. Since the group membership is the most important basis of the categorization, one fails to notice the other characteristics of the individual in question. So to combat this, people are trained to see and behave more mindfully toward others.

Longer, Bashner and Chanowitz (1985) taught children to think and act towards children with challengers in a thoughtful way. They found that those who were coached to adopt a mindful set demonstrated less prejudice towards this group of persons. This entire process aims at getting people to think of challenged persons in terms of their skills and abilities and not in terms of the social category to which they belonged.

Becoming aware of individuals and their particulars is a sure way to lessen prejudice that occurs due to mindless categorization.

Prejudice based on gender

The division of men and women is biological. However, the stereotypes involving the female gender, is highly culturally dependent. Because men are physically muscular and stronger, and women gentler and delicate, the traits associated with

men and women are different. Men are seen as assertive, confident, decisive, ambitious, etc., while women are perceived as passive, dependent, indecisive, etc. These are stereotypes and in keeping with these cognitive make up, positive traits are associated with men and negative traits with women. Once the stereotype is in place, the male group perceives himself as being superior to women. Differences in the stereotypes between men and women may be partly true, but the extent to which they exist are more a myth than in reality, Eagly and Carli (1981).

11. MOTIVATION

Motivation is the very heart of the learning process. Adequate motivation not only sets in motion the activity which results in learning, but also sustains and directs it. It has been stated, “Motivation arouses interest. Interest is the mother of attention and attention is the mother of learning. Thus to secure learning you must first catch the mother, grandmother and great grand-mother.” Motivation is an indispensable technique for learning. It energizes and accelerates the behaviour of learner. Desirable changes in learner’s behaviour are only possible when a learner is properly motivated. No learning is possible without motivation.

The word motivation has been derived from the Latin word *movers* which means to move. Motivation is an internal force which accelerates a response or behaviour. Some learners learn the same subject-matter or task more efficiently than others, some find it more rewarding and interesting than others; and some enjoy it more than others. At any given time learners vary in the extent to which they are willing to direct their energies to the attainment of goals, due to difference in motivation.

Tremendous research has been conducted on motivation in the last five decades and a number of definitions and theories have been given to explain motivation. K B Madson (1975) in his book, *Theory of Motivation* has given twenty-four definitions and theories of motivations which provide different explanations of learning and human behaviour. Some of the important definitions are given here for having an adequate understanding of the term motivation.

1. *C F Skinner* (1947)—“Motivation in school learning involves arousing, persisting, sustaining and directing desirable behaviour.”
2. *G M Blair and Others* (1947)—“Motivation is a process in which the learner’s internal energies or needs are directed towards various goal objects in his environment.”
3. *JP Guilford* (1950)—“A motive is any particular internal factor of condition that tends to initiate and sustain activity.”
4. *A H Maslow* (1954)—“The self-actualization tendency is growth motivation. Self-actualization is the development of personality which frees the person

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- from the deficiency problems of growth. Motivation is constant, never ending, fluctuating and complex and that it is an almost universal characteristic of particularly every organismic state of affairs.”
5. *W A Kelly (1955)*— “Motivation is the central factor in the effective management of the process of learning. Some type of motivation must be present in all learning.”
 6. *LD Crow and A Crow (1962)*— “Motivation is considered with the arousal of the interest in learning and to that extent is basic to learning.”
 7. *K Lovell (1964)*— “Motivation in school learning involves arousing, persisting, sustaining and directing desirable behaviour.”
 8. *HW Bernard (1965)*— “Motivation is the stimulation of actions towards a particular objective where previously there was little or no attraction to that goal.”
 9. *T W Atkinson (1966)*— “The term motivation refers to the arousal of tendency to act to produce one or more effects.”
 10. *F G McDonald (1972)*— “Motivation is an energy change within the person characterized by affective arousal and anticipatory goal relations.”
 11. *C W Good (1973)*— “Motivation is the process of arousing, sustaining and regulating activity.”
 12. *D O Hebb (1975)*— “The term motivation refers (i) to existence of an organized phase sequence (ii) to its direction and content (iii) to its persistence in given direction or stability of content.”
 13. *Bernard (1980)*— “Motivation is the stimulation of actions towards a particular objective where previously there was little or no attraction to that goal.”
 14. *Arun Monappa and Mirza S Saiyadain (1985)*— “Motivation is propensity or the level of desire of an individual to behave in a certain manner at a certain time and in a certain situation.”

Characteristics and Functions of Motivation

1. Motivation is arousing interest in learning
2. Motivation is sustaining interest in learning
3. Motivation is directing behaviour
4. Motivation initiates and energises activity in learning
5. Motivation leads to self-actualization in learning
6. Motivation arouses, sustains and directs behaviour

7. Motivation stimulates learning activity
8. Motivation is the arousal of tendency to act and produce result
9. Motivation is directed to a selective goal
10. Motivation provides the energy and accelerates the behaviour of the learner
11. Motivation releases the tension and helps in satisfying the needs of the learner
12. Motivation is the internal condition or factor of learning

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Terminology of Motivation

Following terms are usually used:

1. *Motive*—According to McDougall, “Motives are conditions—psychological and physiological within the organism that dispose it to act in certain ways.”
2. *Drive*—According to Boring, “A drive is an intra-organic activity which initiates for specific activity and behaviour.”
3. *Incentive*—Incentive is an object or external condition perceived as capable of satisfying an aroused motive that tends to elicit action to attain that object of condition.
4. *Interest*—According to Bingham, “An interest is tendency to become absorbed in an experience and to continue it.”
5. *Curiosity*—Curiosity implies the tendency to investigate and seek to learn more about new objects with which there was no previous experience.
6. *Goal*—It is the end result immediate or remote which the individual seeks.
7. *Arouser*—According to Donald Hebb, “Arousal is an energizer of an organism.”
8. *Expectancy*—It is a momentary belief that a particular outcome will follow a particular act.

Motivation, Hierarchical Needs and Educational Implications

A Maslov (1954) suggested a hierarchical set of five basic needs which must be satisfied to reach the highest level of motivation. These needs are as follows:

- (i) Physiological,
- (ii) Safety
- (iii) Love and Belongingness
- (iv) Self-esteem
- (v) Self-actualization

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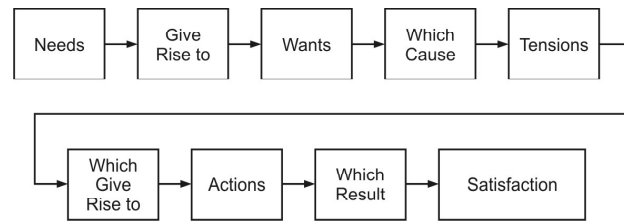


Fig. 17: Motivational Cycle: Needs—Wants—Satisfaction Chain

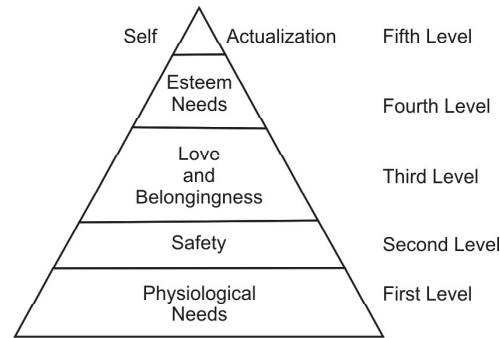


Fig. 18: A Schematic Representation of Maslow's Hierarchy of Motivation.

Higher needs can be satisfied only after the lower needs are satisfied.

- (i) *Physiological Needs.* These needs are like hunger, thirst, etc., and serve the function of the maintenance of the organism. A severe deprivation of food, for example, can deprive the child of various opportunities of his intellectual and other developments.
- (ii) *Safety Needs.* Children want to have a safe environment. If the safety needs are not satisfied, the child feels a sense of insecurity and develops mistrust.
- (iii) *Love and Belonging Needs.* When the child has his sense of security and trust, he develops affectionate relationships with other people (parents, peers and teachers, etc.) and has the desire to belong to a wider group. Children need affection from all quarters.
- (iv) *Self-esteem.* The child at this level is able to function well in interpersonal situations. He develops the desire for achievement and competence, for independence and freedom, for reputation and prestige.
- (v) *Self-actualization.* This is the highest level of motivational goals. It refers to a child's desire for self-fulfilment, to realize his potentialities. This has a special significance at the adolescence stage.

Characteristics of Self-actualizers (Persons Who Achieve Self-actualization)

1. They demonstrate an efficient perception of reality and acceptance.
2. They accept themselves and others.
3. They show high degree of spontaneity and simplicity.

4. They possess problem-centred orientation.
5. They believe in privacy.
6. They are somewhat detached.
7. They appreciate goodness.
8. They tend to be autonomous and independent of their environment.
9. They show mysticism at times.
10. They identify themselves with mankind
11. They develop deep interpersonal relations with others.
12. They are democratic in outlook.
13. They distinguish means and ends.
14. They have a sense of humour.
15. They are creative.
16. They are adaptable.

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Development of Motivation

Gourevitch and Feffer (1962) identified four stages in the development of motivation; each stage characterized by its own type of reinforcement. In the first stage, reinforcement is concrete and bodily. It is direct satisfaction of a physiological need. In the second stage, reinforcement is concrete but external involving tangible rewards such as prizes or intangible rewards like affection or belongingness to a group. The third level involves abstract but external reinforcement like esteem of others, being well-thought by others, etc. The final level involves active concern for self-actualization, reinforced by abstract and internal reinforces, such as self-respect.

Teachers are expected to keep in mind all these stages of development of motivation while dealing with children.

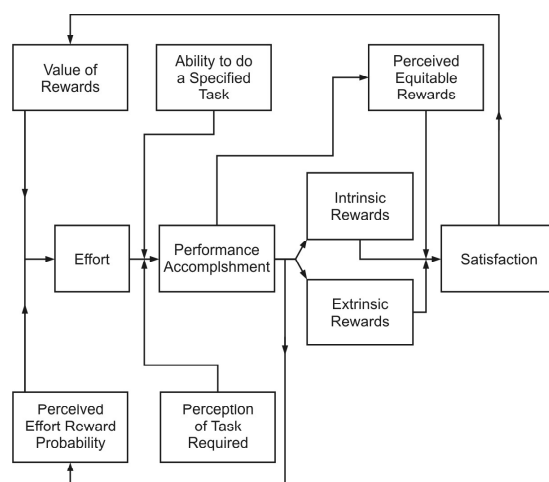


Fig. 19: Porter and Lawler's Motivational Model

Classroom Motivation: Different Techniques

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Students in the classroom learning need constant motivation from the teachers so that optimum use of their talents may be made for their development. The needs are the basis of motivation. Therefore, techniques that the teachers employ to arouse and maintain motivation will be successful only insofar as they make them perceive that progress is being made towards need-satisfaction. Since individual children differ in regard to their specific needs according to their personality patterns and socio-economic background, the teachers will have to vary their motivational techniques and employ them judiciously. In other words, every individual pupil should be led towards goal that he is aware of and will want to attain. Secondly, goals should be within each pupil's reach, and should seem attainable to him. Thirdly, he should be able to judge whether or not he is attaining his goals and how he is falling short. Fourthly, a teacher should not rigidly and strictly adhere to one technique of motivation but he should make use of all techniques judiciously and scientifically.

- (1) *Attractive Physical and Environmental Conditions*: First of all the teacher should attend to the physical conditions of the classroom. There should be no distracting factors in and around the classroom. Noise, strong light and some undesirable scenes often distract the attention and do away with the interest. Abnormal temperature is also a disturbing element. Monotony creates boredom.

The rooms should be ventilated and tastefully decorated. There must be flowery plants in the school compound. Cleanliness should be stressed adequately.

- (2) *Sublimation of Innate Impulses*: Most of the behaviour of small children is directed by their innate impulses. Curiosity, construction, self-assertion, submission, pugnacity and hoarding are some of their most powerful drives which form the basis of all kinds of their activities. Small children are very curious by nature. They like to do many things. Every new and strange things attract them. An efficient teacher will stimulate the impulse of curiosity. He will always start the lesson by exhibiting some very new and strange aspect of the same. Similarly, children like to construct things. The teacher should encourage the children to learn by constructing and creating things.
- (3) *Stimulus Variation and the Teacher*: It has been generally observed that children are not able to attend to one thing for a very long period. The effectiveness of the teaching-learning process in such a situation depends to a great extent on the stimulus variations used by the teacher behaviour. Some of the common teacher behaviours in the classroom which fall under variation are as follows:

- (i) Teacher movement
 - (ii) Teacher gestures
 - (iii) Changes in speech pattern
 - (iv) Changes in sensory focus
 - (v) Changes in posture.
- (4) *Reinforcement (Praise and Blame)*: “Praise, like gold and diamonds, owes its value to scarcity”, writes Robinson Johnson. It implies that this technique should be employed with great care. These may be classified as:
- (i) *Positive verbal reinforcement*: Following a pupil’s answer, the teacher verbally indicates pleasure at the pupil’s response by the use of words like ‘Good’, ‘Fair’, ‘Excellent’, ‘Correct’, etc.
 - (ii) *Positive non-verbal reinforcement*: This includes
 - (a) Teacher’s nods and smiles.
 - (b) Teacher’s friendly movements towards pupils.
 - (c) Teacher’s friendly look.
 - (d) Teacher writing student’s response on the blackboard.
 - (iii) *Negative non-verbal*: This comprises gestures and facial expressions, such as those depicting impatience, annoyance, contempt, pity, sometimes by sneering, frowning, etc.
 - (iv) *Negative verbal*: This includes comments like ‘No’, ‘Wrong’, ‘No good’, ‘Poor’, ‘Of course not’, etc.
- (5) *Extrinsic Learning Rewards and Punishment*: These are also termed as reinforces, and the process of giving rewards and punishment is known as reinforcement. Rewards, whether material or symbolic and psychological, enhance and satisfy child’s safety, belonging and esteem needs, and as such are capable of acting as incentives. Material rewards seem to work better for poor children and symbolic rewards seem to work better for children from rich homes. Thus a reward in order to act as an incentive must be perceived by the child as of some value. As extrinsic motivator, rewards may, however, become an end in themselves, and the child may not develop any intrinsic impulsion to identify himself with the learning activity. Therefore the students should be helped to perceive that successful performance is more important than any extrinsic incentive like prizes, marks and certificates. Intrinsic learning takes place when the individual is motivated without rewards, etc.
- (6) *Pleasure and Pain*: According to the oldest theory of behaviour, pleasant experiences which give satisfaction are sought after and painful experiences

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are avoided by an individual. This theory has direct implication in classroom teaching-learning. The teacher must provide pleasant and satisfying experiences to the students so that they are motivated for further learning.

- (7) *Attainable Goal*: There should be a goal to be reached in every lesson. Only then the students can endeavour to continue their efforts to a particular direction. The goal must be made clear to students.
- (8) *Experience of Success*: Experience of success motivates a child to continue an activity. The teacher should, therefore, make school work, both curricular and co-curricular, sufficiently varied so that each pupil has a chance to experience success at his own level. He must ensure frequent and regular experience of success or reinforcement throughout all phases of learning, but particularly during the earlier and more difficult phases.
- (9) *Competition and Co-operation*: Competition is a spur to activity. But competition on individual basis is likely to be unequal and therefore threatening to some students. Competition between groups makes it possible to spread the share of success or failure.

Co-operation too provides motivation since it provides social situation to learners when they find satisfaction of their acceptance and belonging needs.
- (10) *Knowledge of Progress*: Pupil's knowledge of their progress, of how well they are moving towards their goal is a very effective form of motivation. It also helps them put greater efforts. Individual progress charts not only inform a child as to how he is doing but also keeps the child involved in learning activity. Children are said to learn better through programmed learning because they get immediate information of success or failure.
- (11) *Novelty*: The striving toward self-actualization makes pupils search for the new and the different. Field trips, excursions, dramatics, sports, literary activities, etc., satisfy the pupil's needs for self-actualization by providing them opportunities. But their safety needs require that they should know beforehand when and how the new experiences will be provided.
- (12) *Individual Differences of the Children*: Children have different interests and capabilities. All the children cannot be motivated alike for all the lessons at all time. It is the duty of the teacher to discover individual interests and capabilities of the children in his charge to motivate them accordingly.
- (13) *Teaching Skills*: Teaching skills of the teacher greatly influence motivation. It is not easy to give an exact number of teaching skills involved in motivating students in the class. Commonly identified skills in the teaching-learning process may be listed as under:
 - (i) Skill in introducing the topic
 - (ii) Skill in putting questions

- (iii) Skill in dealing with pupil's answers
 - (iv) Skill in stimulus variations
 - (v) Skill in the use of blackboard or the chalkboard
 - (vi) Skill in handling teaching aids and other equipments
 - (vii) Skill in non-verbal cues
 - (viii) Skill in reinforcement
 - (ix) Skill in the use of illustrations and examples
 - (x) Skill in the exposition of sub-matter
 - (xi) Skill in explanation
 - (xii) Skill in encouraging group discussion
 - (xiii) Skill in planned repetition
 - (xiv) Skill in drawing out conclusions from students
 - (xv) Skill in teacher liveliness
 - (xvi) Skill in the closure of the lesson
 - (xvii) Skill in using appropriate methods of teaching
- (14) *Teacher's Own Motivation and Interest in Teaching*: The teacher must be interested in what he is teaching and in the children whom he is teaching. If he is not interested in the work himself, he can never motivate the class. It may be said that a teacher who has been teaching the same subjects to the same classes for years tends to lose interest. But this is not the fact. The subject matter may be the same but the children are not the same. Even the subject matter is changing and developing. Moreover, with experience the teacher will discover new approaches and methods of teaching even the same subject matter.

Theories of Motivation

Twenty-four theories of motivation have been propounded by experts. These theories provide divergent explanations of motivation. It is neither feasible nor desirable in the limited scope of this book to provide a detailed treatment. Only an overview of some of the popular theories is given here. It is also observed that these theories supplement each other and point towards the same truth.

1. Pawn Theory
2. Instinct Theory
3. Need Theory
4. Stimulation Theory
5. Behaviour (or Learning) Theory

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6. Social Theory
7. Depth Theory
8. Physiological Theory
9. Theory of Achievement Motivation

1. Pawn Theory of Motivation

This is based on the transcendental approach to the problems of life. According to this theory, we are a *pawn*, a puppet, an instrument in the hands of God. This theory passes on the responsibility to some *mysterious power* which is something intangible and which motivates human beings to action.

2. Instinct Theory of Motivation

McDougall is the originator of this theory. According to him, "The human mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action, whether individual or collective and are the bases from which the character and will of individuals and of nations are gradually developed under the guidance of the intellectual faculties." McDougall put forward a list of 14 instincts and attached 14 emotions with them. This theory became very popular in Britain. Nunn, Burt, Ross, Hughes and Valentine, etc., accepted this theory. However, American psychologists did not find any weight in it.

3. Need Theory

A. Maslow (1908–1970) was the main advocate of this theory. We have already discussed hierarchy of needs as stated by him. There are two sets of needs: (i) Primary or biological, and (ii) Secondary or psychological. The more intense the need, the more is the motivation.

4. Stimulation Theory

According to this theory all inner and outer stimuli that bear upon a person at one time constitute his psychological field and determine his behaviour jointly through interaction.

5. Behaviour or Learning Theory

This is more elaborate than the need theory. Hull and his associates are the supporters of this theory. The theory has three main tenets:

- (i) All motivated behaviour is based on needs and desires;
- (ii) All learning involves reward in the sense that only those responses that reduce need or drive are stamped in; and
- (iii) Needs may be biological or psychological, primary or secondary.

Tolman, Hebb and Mowrer do not share this view. They argue that all learning is not like that. Learning can be 'cognitive type' also. It is not only the 'need reduction' but also 'avoidance of pain' that goads one to learn.

6. Social Theory

According to this theory, causes of the social behaviour are to be found in the social environment. There are two streams of this theory:

- (i) *Cultural Pattern*. According to this view, an individual is cast in the mould of the culture to which he belongs. The different cultures would, therefore, produce different types of personalities.
- (ii) *The Field Theory*. According to this theory, behaviour is caused by the interaction between a person and his environment.

7. Depth Theory

Freud is the main protagonist of this theory. The spring of action is unconscious which is dark, ruthless, very powerful and illogical. Special exploratory techniques are needed to dig out the unconscious. Unconscious motives influence our conscious thought and conduct.

8. Physiological Theory

This theory holds that the secrets of mind are locked within the cells of the nervous system.

9. It is to be noted that the theory of achievement motivation has been discussed in the subsequent section of this book.

12. ACHIEVEMENT MOTIVATION

McClelland David (1953) and Atkinson W John (1958) came to the conclusion that in every individual there is a need for achievement. A person who has a high need for achievement considers problems and obstacles as challenges to be met. According to this theory, human beings differ from one another in the strength of achievement motive. It is this difference in the strength of motivation to achieve that is important in understanding the development. The need for achievement develops in early childhood. It depends upon the discipline of the home. Parents' expectation and guidance to the child develop need for high achievement in life.

The teacher can play an important role in the development of motivation by taking the following steps:

STEP 1. The teacher should emphasize the importance of achievement motive in life by means of narrating the exploits of great personalities and their achievements. Students may be motivated to follow the footsteps of great persons.

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STEP 2. The teacher's encouraging and friendly attitude and his enthusiasm in work will create the necessary environment for achievement motive in children.

STEP 3. The teacher will guide the students in developing realistic achievement motives.

STEP 4. Attempts should be made to convince the students that new motives will improve their self-image and is an improvement upon the prevailing ones.

STEP 5. The teacher should develop habits of self-study among students.

STEP 6. The teacher should encourage the students to evaluate their own achievement from time to time.

STEP 7. The teacher should develop conducive social environment in the class so that every student should think that he is wanted and has a role to play.

Rewards and Punishments in Motivating Children

No Misfit Children—Punishment by Natural Consequences. “There are misfit schools, misfit tests and studies, misfit dogmas and traditions of pedants and pedantry. There are misfit homes, misfit occupations and diversions. In fact, there are all kinds and conditions of misfit clothing for children, but in the nature of things, there can be no misfit children,” writes Frederick Burk. Educationists representing such a school of thought protest against all sorts of well-established systems of rewards and punishments. Their watchword is “Freedom to the child,” because they think that by nature, a child is innocent and noble and adult restrictions and discipline simply spoil the intellect of the child and stand in the way of his progress and happiness.

Bertrand Russell remarks, “The man whose tongue is constricted by laws or taboos against free speech, whose pen is constricted by the censorship, whose laws are constricted by an ethic which considers jealousy a better thing than by affection, whose childhood has been imprisoned in a code of manners, and whose youth has been drilled in cruel orthodoxy, will feel against the world that hampers him with the same rage that is felt by the infant whose arms and legs are held motionless. In this rage he will turn to destruction becoming a revolutionary militarist, or a prosecuting moralist according to temperament and opportunity.”

Similarly, the votaries of “Free discipline,” would dub all rewards as bribery.

Many great educationists like Rousseau protest against all sorts of well-established systems of rewards and punishments and have waged a bitter war against the theory of original sin and its repression. Their watchword is ‘*Freedom to the child*’ because they think that by nature a child is innocent and noble and adult restrictions and discipline simply spoil the intellect of the child and stand in the way of his progress and happiness. They believe in the discipline of natural

consequences' and are convinced that natural punishments are the best and leave no room for punishments in the life of the school. Rousseau says, "Children should never receive punishment as such—it should always come as the natural consequence of their fault." Sir T Percy Nunn writes, "The conviction that punishment and the fear of punishment are the natural foundation of school government, is gradually being recognized as merely a barbarous superstition." A S Neill, in his book, *The Free Child* writes, "My contention is that unfree education ignores almost entirely the emotions of life, and because these emotions are dynamic, their lack of opportunity for expression must and does result in cheapness, ugliness and hatefulness. Only the head is educated, but if the emotions are free, intellect will look after itself."

Herbert Spencer would like the child to suffer the unavoidable consequences of his conduct.

Punishments are Indispensable. Bagley puts it, "The child is immature and helpless and he must not be given a long rope with which he may hang himself."

Bray justifies punishments with these words, "Punishment is the lesser evil applied to avoid the greater one that lives in the future." It is always seen that evil if not checked in time brings havoc ultimately. "Nip the evil in the bud" is an old saying.

P C Wren, though admits that punishment is an evil thing to be avoided, yet says that it is a necessary evil like the surgeon's knife.

According to H Thring, school punishment is not vengeance. Its object is training, first of all the training to the wrong-doer; next the training to other boys by his example. Both he and other are to be deterred from committing the offence again.

The naturalists dub all rewards as bribery. They think these rewards have a demoralizing effect on the child because they tempt the child to work not for duty's sake but for the sake of prize.

Rewards sometimes lead to unhealthy jealousies among students. Moreover, they affect only a few students and leave group on the whole untouched. They encourage unnecessary competition and affect emotional development adversely.

The protagonists of the system of rewards on the other hand argue that the rewards provide incentive to the students to work hard. They contend that society as a whole is governed by a system of rewards and punishments.

Psychologically also the system of rewards and punishments can be justified if we take into account the Law of Effect as enunciated by Thorndike.

Rewards provide incentive for healthy emulation among individuals and group of individuals.

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When the work of the students is given appreciation in the presence of others, they feel encouraged and reinforcement is provided. This helps in infusing great confidence in them.

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It gives happiness to the parents when their children get prizes. They encourage their children to put in all the more labour.

Rewards may be given for:

- (a) Regular and punctual attendance.
- (b) Good conduct.
- (c) Progress in studies.
- (d) Proficiency in games, etc.
- (e) Service rendered for a noble cause.

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