



Man is a rational animal. He has got the power of reasoning. This power of reasoning enables him to learn things quickly. Learning plays very important role in determining the behaviour of an individual. All human behaviour can be traced back to learning. Learning is the basis of success in life. The miracles of present day civilisation are the result of learning. Learning occupies very important place in the field of education. It is through learning that man brings in so much changes in his instincts that it becomes difficult to recognise them. We want to educate the students and it is only learning which is education. Unless we are aware of Nature, Factors, Methods, Laws and Theories of Learning we shall not be in a position to get success in giving thorough and proper education. So we shall describe Nature of Learning, Factors of Learning, Domains of Learning, Methods of Learning, Laws of Learning and Theories of Learning etc.

#### (A) NATURE OF LEARNING

##### (1) Meaning and Definition of Learning :

Learning is said to be equivalent to change, modification, development, improvement and adjustment. It is not confined to school learning, cycling, reading, writing or typing but it is a comprehensive term which leaves permanent effects or impressions on the individual. Some of the definitions of learning are as follows :

1. **Daniel Bell**, in Encyclopaedia of Psychology, says that "Learning is modification due to energies of organism and environment impinging on the organism itself."
2. **Encyclopaedia of Educational Research** reads, "Learning refers to the growth of interests, knowledge and skills and to transfer of these to new situations."
3. **Gates** says, "Learning is modification of behaviour through experience and training."
- ✓ 4. **Crow and Crow** are of the view that "Learning involves the acquisition of habits, knowledge and attitudes."
5. **Skinner** defines "Learning as acquisition and retention."
6. **According to Garry and Kingsley**, "Learning is a process by which behaviour is originated or changed through practice or training."
7. **Munn's view** : "To learn is to modify."
8. **Traver's view** : "Learning is a process that results in the modification of behaviour."
9. **Peel's view** : "Learning is change in the individual following upon changes in the environment."
10. **Cronbach's view** : "Learning is shown by a change in behaviour as a result of experience."
11. **Woodworth's view** : "Learning is a process of acquiring new knowledge and new responses."
12. **Guilford's view** : "Learning is a change resulting in behaviour."
13. **Pavlov's view** : "Learning is habit formation resulting from conditioning."
14. **View of Morse and Wingo** : "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."

In short, learning is a fundamental process of life engaging much of our waking hours, affecting all forms of behaviour, skills, knowledge, attitudes, personality, motivation, fear, mannerism etc. It involves :

- (1) Acquisition of new experience.
- (2) Retention of new experience in the form of impression.
- (3) Development of experiences step by step.
- (4) Modification of experiences and creation of old and new experiences.
- (5) Organisation, synthesis and integration of old and new experiences.

**(2) Meaning of Efficient Learning :**

Efficiency in learning can be measured by three factors namely accuracy, speed and retention.

1. **Accuracy** : How accurate do you remember ?

2. **Speed** : How soon do you remember ?

3. **Retention** : How long do you remember ?

Overall efficiency in learning can be determined by devising weightage for these three factors.

**(3) Views Regarding Nature of Learning :**

1. **Behaviouristic view** : Behaviourists are of the view that learning is a change in the behaviour as a result of experience. Men and other living-beings react to the environment. As soon as the child is born, he tries to learn something from the environment.

2. **Gestalt view** : According to this view, learning depends on gestalt or configuration (wholeness of the situation). Learning is total reaction of total situation.

3. **Hormic view** : This view was developed by McDougall. It stresses the purposeful nature of learning i.e., learning is goal-directed activity.

4. **Trial and error view** : This view was put forward by Thorndike. He conducted many experiments on cats, dogs and fish and concluded that most of the learning takes place by trial and error.

5. **Lewin's view of learning** : Kurt Lewin was the upholder of this view. He stated that learning is the perceptual reorganisation of the situation and motivation plays an important role in learning.

**(4) Characteristics of Learning illustrating Meaning of Learning :**

1. **Progressive change in behaviour** : Learning brings progressive change in behaviour as the individual reacts to the situation and i.e., why learning is known as improvement.

2. **Learning is motivated by adjustment** : The individual has to adjust to new environment.

3. **Learning is universal in nature** : All animals learn. Man is a rational animal and he learns more.

4. **Learning is never ending growth** : We always inspire to learn more and more. One achievement leads to further incentive, pursuit and effort.

5. **Learning is continuous** : Learning is a continuous process and not restricted to childhood period. It goes with life. Death is its end point.

6. **Learning is goal-directed or purposive** : When the purpose or goal is more clear, vivid and explicit, the learning becomes meaningful and effective to the learner.

7. **Learning is active and creative** i.e., learning largely depends upon the activities of the learner. It is said that no learning can take place where there is no self-activity. Learning is, therefore said to be the result of activity and experience. It is creative experience of all knowledge.

8. **Learning is aroused by individual and social needs** i.e., learning depends upon individual—his needs, problems, interests, attitudes, ambitions, aspirations and needs of the society. In case of some individuals, learning may be quick and fast and in others it may be slow and steady. Learning is also affected by social environment. No learning can take place in the absence of environment.

9. **Learning is response of the whole individual to the total situation** : i.e., individual reacts to the total learning situation as a whole.

10. **Learning is transferable** i.e., transfer takes place in learning but amount of transfer may vary. Transfer occurs when there is similarity of contents, techniques, ideals, procedures and attitudes. Transfer leads to economy in learning as it takes place from one field of study to another and from classroom situation to life situation.

11. Learning is possible on cognitive, affective, and conative side : Acquisition of knowledge is cognitive, modification of emotions is affective and acquisition of skills and habits is conative.

12. Learning is process and not a product : For a man in the street end product is seen as learning. For a psychologist, learning is a process which can be summed up in the following steps :

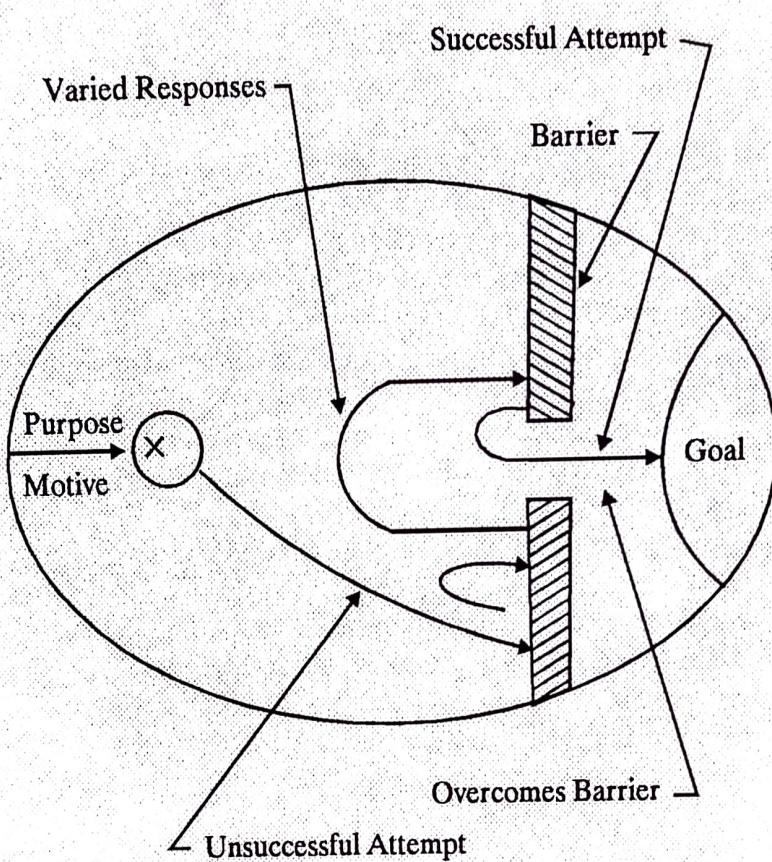
(a) Motive or need : First of all motive or need arises. Motive is force which impinges or compells the individual to behave or to react or do a particular task.

(b) Goal : If motive or need is there the goal is set up by the teacher or anybody else.

(c) Adjustment : Thirdly, adjustment on the part of child begins.

(d) Changes : Changes in the behaviour of the child take place.

(e) Fixation or stabilisation : Later on those changes in the behaviour of the learner are stabilised.



*Fig. : Process of Learning.*

#### (5) Stages or Types of Learning :

1. Motor learning : When the child is young and his mental capacities are not so developed he learns the motor activity such as eye-hand coordination, walking, running, language etc. It is a sort of imitation learning.

2. Perceptual learning : As the mind develops, the child has his percepts. He gets sensations through the different sense organs and gives meaning to them. It means that objects around him are meaningful to him and he perceives them. He learns the names of different objects in order to differentiate them. The child now begins to learn by concepts. Blind imitation is avoided. The child uses his mind to solve problems by insight.

**3. Conceptual learning :** At this stage, mental capacities are sufficiently developed from its own ideas and concepts. The learning becomes ideational one ; power of thinking and judgement is developed. The individual is now able to solve problems in his own way.

**4. Associative learning :** Conceptual learning is helped by associative learning. New concepts are associated or linked with the past concepts and knowledge is amassed.

**5. Appreciative learning :** Appreciative learning is on affective side while conceptual learning is on cognitive side. A child uses his aesthetic sense from the very beginning.

**6. Attitudinal learning :** The child learns or develops certain attitudes like an attitude of affection towards his parents, an attitude of belongingness towards his family and an attitude of respect towards the teacher.

## (B) FACTORS INFLUENCING LEARNING : PERSONAL AND ENVIRONMENTAL

### (1) PERSONAL OR INDIVIDUAL FACTORS :

Personal factors of learning can be studied under psychological and physiological factors :

**(A) Psychological factors :** Important personal psychological factors influencing learning are given below :

**1. Maturation :** Learning depends upon maturation. If the individual is matured to learn a particular activity, he will learn effectively. If the individual is not mature, learning will not be effective.

**2. Readiness :** If the learner is ready to learn a particular activity, he will learn better and quickly.

**3. Attitude and aptitude :** Favourable or positive attitude is must to get success in any field of endeavour. Favourable attitude towards the job or work makes one more active and enthusiastic and favours learning. Negative attitude of the pupil delays learning. Suitable aptitude of the person helps in quick and effective learning.

**4. Capacity :** The greater the capacity for learning a person has, the better will be the learning.

**5. Motivation :** Motives like (1) reward, (2) success, (3) competition, (4) level of aspiration, (5) punishment are powerful incentives to the learner for better learning.

**6. Attention and interest :** If the learner is motivated to learn a particular task, he will take more interest in the task with full attention and hence he will learn that task better. Best learning takes place when the teacher arouses attention and interest of students.

**7. Memory :** A learner who has good memory will learn quickly and effectively.

**8. Mental health :** A child who is mentally healthy i.e., free from frustrations, conflicts, anxieties and worries will learn better than the child who is not mentally healthy.

**9. Goal :** Learning depends upon goal of the learner. Appropriate, stronger and clear goal of the person (learner) is conducive to learning.

**10. Will :** The stronger the will and determination of learner (person) the quicker and effective will be the learning.

**11. Intelligence :** Intelligence of the learner is also positively related to learning. It facilitates effective learning. The greater the intelligence of the person, the more effective may be his learning.

**12. Mental fatigue :** Freshness promotes learning and mental fatigue inhibits learning.

**13. Sensation and perception :** Sensation and perception are the basis of cognitive learning. The stronger the power of perception, the greater will be the amount of learning.

**14. Needs :** Physiological, psychological, educational, vocational and social needs of the learner (person) are conducive to learning.

**15. Aspiration :** High level of aspiration facilitates learning.

### (B) PHYSIOLOGICAL FACTORS :

**1. Food and nutrition :** Poor food and nutrition have an adverse effect on learning while rich food and nutrition contribute towards better learning.

**2. Drugs :** Studies have shown that alcoholic and narcotic drugs, use of tobacco, and addictive items are harmful for the neuro-muscular system of the body and consequently, learning may be hampered.

**3. Physical fatigue :** Fatigue may be physical or mental. Fatigue causes boredom and indolence and has negative effect on learning. Rest and freshness are helpful in learning.

**4. Physiological defects, handicaps and diseases :** Physical defects like visual defects, hearing defects and other handicaps, malfunctioning of glands and diseases like paralysis, tuberculosis, heart disease, epilepsy, cancer, etc. obstruct learning. Studies have shown that even poor vision may cause headache, nausea, and a general disinclination to study. Other organic defects which occur in tonsils, ears, appendix, teeth cause irritability and many other disturbances and negatively affect learning. Physical illness and tension cause frustration and adversely influence learning.

**5. Good physical health :** Good physical health is a pre-requisite for effective learning. Sound physical health provides enthusiasm, vigour and vitality for better learning.

**6. Age :** Research studies have shown that learning efficiency increases with age to certain extent after which it remains stationary for some time and ultimately tends to decrease during old age. Thus, we find that children are speedier and more efficient at learning tasks as they grow older.

## (2) ENVIRONMENTAL FACTORS INFLUENCING LEARNING :

Environmental factors include the following factors :

### (A) Task Factors (Content or Material-related Factors) :

These are the important task factors (content or material-related factors) influencing learning :

**1. Difficulty of the task :** Difficult tasks take more time to learn. Sometimes they discourage children.

**2. Similarity of the task :** Tasks which have some similar elements are learnt better, quickly and effectively.

**3. Meaningfulness of the task :** The more meaningful is the material, the more rapid and easier is the learning. The meaningless material is difficult to be learnt.

**4. Length of the task :** The longer is the task the more difficult it is to be learnt.

**5. Appropriateness of the task :** Appropriateness of the task facilitates learning. This means that the subject-matter should be appropriate to the age level, maturity, intelligence and interests of the students.

**6. Pleasantness and unpleasantness of the task :** Generally, pleasant tasks are learnt quickly than the unpleasant tasks.

### (B) Method (Method-related) Factors Influencing Learning :

Important method-related factors of learning are given below :

**1. Whole and part method :** Experiments have proved that generally whole method gives better results than part method. Learning by whole method is intelligent learning, as it helps to find out the meaningful relation and to grasp the material as a whole. Being intelligent learning, it can be retained for a longer time than learning by part method which employs cramming.

**2. Recitation method :** Recitation method helps in efficient and effective learning. It arouses active participation of the learner, yields progressive information about the errors and right responses, thereby permitting the correction of errors, furnishes an immediate goal to work for, gives an exact and immediate knowledge of results, favours an aggressive and independent attitude, and helps in the organisation of material.

**3. Practice :** 'Practice makes a man perfect' is a well known proverb. Learning is more efficient when practice is distributed at intervals over a period of time than when it is considered in one period as in cramming (Ebbinghaus 1855 ; Leuba and Hyde 1893).

**4. Guidance and cues :** Guided learning is always better than unguided learning. Guidance saves time and energy of the learner, eliminates wastage and stagnation. But too much guidance should be avoided so that students may not learn the habit of remaining dependent upon others or teachers.

**5. Learning by doing :** Learning by doing facilitates learning. So the pupils should be encouraged to learn through activity. Theoretical teaching should be replaced by practical application of knowledge, experimentation and personal application.

**6. Learning activities and active participation :** Learning is active and it requires concentrated efforts on the part of the learner. Students should be encouraged to ask various questions and to take active part in the class.

**7. Learning by insight :** Learning by insight helps in retaining (learning) for a longer period of time and minimises wastage of time. Therefore, spoon-feeding or cramming should be discouraged.

**8. Time of learning :** Experiments have shown that there are significant variations in learning efficiency during different hours of the day. It has been established that morning and evening hours are the best hours of study. During the day, there is decline in the mental capacity due to noise.

**9. Vigorous application :** Slow learning is seldom efficient. Learning vigorously is a great asset and it pays much. The students should be told to work whole-heartedly. They must put their heart and soul while learning something.

#### (C) Teacher-related Factors :

##### (1) Methods of Teaching :

Learning is influenced by suitable methods of teaching like :

(1) Lecturing method, (2) Demonstration method, (3) Experimental method, (4) Discussion method, (5) Seminar method, (6) Assignment method, (7) Tutorial method, (8) Programmed instruction method, (9) Individual practical work, (10) Individual work in workshop, (11) Project method, (12) Heuristic method, (13) Field trip method, (14) Play method, (15) Story telling method, (16) Source method, (17) Audio-visual aids like charts, maps, models, pictures, posters, graphs, transparencies, and electronic media like programmes on radio, television, films, overhead projector, etc.

##### (2) Maxims of Teaching :

Learning is facilitated by use of maxims of teaching like to proceed from : (1) Known to unknown, (2) Easy to difficult, (3) Simple to complex, (4) Concrete to abstract, (5) Indefinite to definite, (6) Particular to general, (7) Empirical to rational, (8) Deductive to inductive, (9) Psychological to logical.

#### (D) Atmospheric and Working Conditions :

**1. Atmospheric conditions :** (1) High temperature and humidity lower the mental efficiency, (2) Lack of ventilation (3) lack of proper illumination, (4) noise and (5) physical discomfort (as we find in overcrowded schools) hamper the learning capacity.

**2. Working conditions :** (1) Good location of the school, (2) good internal set-up, (3) adequate accommodation, (4) decoration, (5) healthful and good sanitary conditions are helpful for efficient learning. On the other hand, bad working conditions like distraction, noise, poor light and ventilation, overcrowding, inadequate seating arrangement and uncongenial environment in home and school hamper efficiency of learning.

#### (E) Organisational set-up :

The organisational set-up of school also influences learning :

**1. Time-table :** Time-table based on sound psychological principles like (1) principle of motivation, (2) fatigue and rest, (3) variety, (4) relative importance of the subject, (5) difficulty level of the subject is favourable to efficient learning. Important and difficult subjects should be taught in the morning. There should be short interval after some periods.

**2. Teacher-pupil relations :** Healthy teacher-pupil relations are helpful in effective learning as they increase motivation and mental competition among the pupils.

**3. Competition :** Healthy competition is conducive to effective learning. The inter-class or inter-house competitions will stimulate the pupils to work more in order to outshine others. Group competition should be strengthened. Jealousy should be avoided.

## FACTORS INFLUENCING LEARNING AND LEARNING PROCESS

PERSONAL FACTORS		ENVIRONMENTAL FACTORS					
Physical (Personal)	Psychological (Personal)	Miscellaneous Environmental Factors	Organisational Setup	Task Factors (Content Related)	Methods of Learning Method-Related	Methods of Teaching Method-Related	Maxims of Teaching Method-Related
1. Food and nutrition 2. Drugs 3. Physical fatigue. 4. Physiological defects 5. Physical Health 6. Age	1. Maturation 2. Readiness 3. Attitude and aptitude 4. Capacity 5. Motivation 6. Attention and interest 7. Memory 8. Mental health 9. Goal 10. Will 11. Intelligence 12. Fatigue 13. Needs 14. Aspirations 15. Sensation and perception	1. Natural surroundings 2. Social surroundings 3. Cultural surroundings 4. Home environment 5. Classroom environment 6. School environment 7. Political environment 8. Religious environment	1. Time-table 2. Teacher-pupil Relations 3. Parents 4. Competition 5. Democratic organisation 6. Pupil's participation 7. Success and praise 8. Rewards 9. Punishments 10. Guidance	1. Difficulty 2. Similarity 3. Meaningfulness 4. Length 5. Pleasantness 6. Appropriateness	1. Whole vs. Part Learning 2. Mediating method 3. Spaced vs. unspaced method 4. Recitation 5. Memory systems 6. Laws of association 7. Learning by insight 8. Activities 9. Time 10. Vigorous application	1. Lecturing 2. Demonstration 3. Experimental 4. Discussion 5. Conference, Seminar etc. 6. Assignments 7. Tutorial (Individual) 8. Programmed Instruction 9. Individual practical work 10. Individual work in workshop 11. Projects 12. Discussion 13. Field trips 14. Teaching machines 15. Electronic Media 16. Audio-visual aids 17. Play way 18. Story telling 19. Source	1. From known to unknown 2. Easy to difficult 3. Simple to complex 4. Concrete to abstract 5. Indefinite to definite 6. Particular to general 7. Empirical to rational 8. Deductive-inductive 9. Psychological to logical

3. **Theory of reward and punishment** is based on this law. Reward should be given for desirable behaviour and punishment should be associated with undesirable behaviour.

4. This law is helpful in *forming and developing the desirable sentiments* in the pupils. Positive sentiments should be associated with satisfying state of affairs.

5. **Problem behaviour and delinquent behaviour** can be improved by associating it with annoying state of affairs (punishment).

6. **Interest** is directly related to this law. Interest causes satisfaction and satisfaction promotes learning and better learning gives higher satisfaction. In the selection of subjects, books, hobbies, games and curricular activities pupils prefer which is interesting to them.

7. **Memory** is also connected with the law of effect. Pleasant things are generally remembered better than unpleasant things.

#### **Limitations of Law of Effect :**

(a) Sometimes punishment is more effective than reward.

(b) Sometimes unpleasant experiences are remembered better than the pleasant experiences.

#### **(B) Secondary or Minor Laws of Learning :**

1. **Law of varied response or multiple response** : The individual makes varied or multiple response to the same situation. *Thorndike's cat* made various multiple responses while trying to get out of the cage.

2. **Law of previous beliefs, attitudes and opinions** : It determines whether response of the individual will be satisfying or annoying. According to *Thorndike* a well fed cat goes to sleep in cage whereas a hungry one tries to get out of it.

3. **Law of partial activity** : According to this law, the learner has the capacity to select the important from the irrelevant element in order to determine appropriate responses.

4. **Law of response analogy or assimilation** : The learner responds to the new situation as he did in the previous similar situation. Thus the new situations must be similar.

5. **Law of associative shifting** : This law is also known as the *conditioned response*. A response may be shifted from one situation to another which is presented at the same time.

A few more laws of learning are :

(a) **Law of recency** / According to this law recent things are remembered better. Hence, students should revise their courses just before the examination.

(b) **Law of primacy** / "First impression is the last impression" is a normal saying. It seems the experiences that are acquired by the child at the primary stage have lasting effect. Hence, the students and the teachers should be most serious even from the first day.

(c) **Law of belongingness** / The law states that if a response belongs to the situation, connection is more easily learned. In other words, if the connection between stimulus and response is natural, the learning will be more effective. Hence, the teacher should create natural atmosphere in the classroom and appeal to the natural tendencies of the child.

(d) **Law of intensity of stimulus** / According to this law, if a stimulus is strong the response will be strong and vice-versa. Examinations present an intense stimulus to study and hence bear a positive effect on learning.

### **(H) THEORIES OF LEARNING AND THEIR EDUCATIONAL IMPLICATIONS**

Learning Theories may be classified in two main categories :

1. **Connectionist Theories or Behavioural Associationist Theories** : These theories are known as Stimulus Response Theories. Within this group, we shall include the following theories :

(1) E.L. Thorndike's Trial and Error Theory.

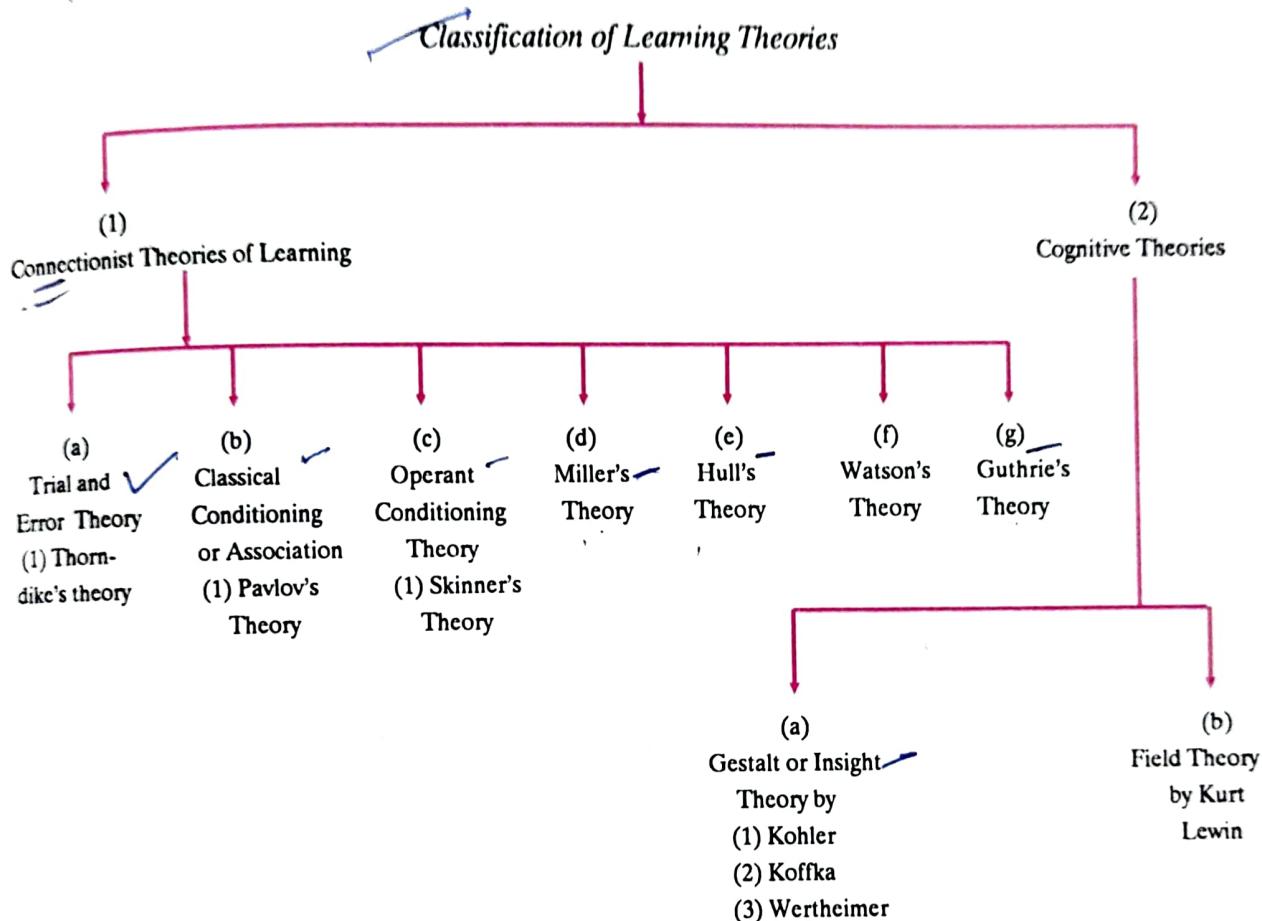
(2) Pavlov's Classical Conditioning Theory or Associative Theory.

(3) Skinner's Operant Conditioning Theory (Instrumental Conditioning Theory).

- (4) Hull's Reinforcement Theory of Learning.
  - (5) Guthrie's Sign Learning Theory.
  - (6) Watson's Theory of Learning.
  - (7) Miller's Theory of Learning
- 2. Cognitive Organisational Theories :**

These theories are also known as Organismic Theories or Gestalt Theories, Cognitive Field Theories or Purposive Theories. These theories of learning include :

- (1) Gestalt or Insight Theory of Learning by Wertheimer, Koffka and Kohler.
- (2) Lewin's Field Theory of Learning.
- (3) Tolman's Cognitive Theory or Sign-Gestalt Theory or Purposive Behaviour Theory of Learning.



Here we discuss some important theories of learning :

### (1) TRIAL AND ERROR THEORY (CONNECTIONISM)

This theory is also known as Pleasure-Pain Theory, Stimulus Response Theory and Bond Theory of Learning. This theory was expounded by American psychologist Thorndike in 1898. He conducted many experiments on cats, dogs and fish and concluded that we learn each and everything by making mistakes and errors. When we begin to learn anything there may be many errors. But as the number of trials goes on increasing, the errors go on decreasing. Thus we learn from mistakes or experience.

In the words of Prof. Woodworth, "The trial and error procedure in attacking a problem consists in doing something, which probably does not succeed, then doing something else, and so on till something does succeed." In other words, trial and error learning consists in trying, failing, varying the procedure and gradually attaining success in a series of trials, without the learner seeing clearly what the conditions of success are. This method is just like finding the appropriate key for a lock out of a bunch in the dark.

If we merely try one key after another without examining them at all, until we find the right key, we are using the trial and error method.

#### **Features or Essentials of Trial and Error Learning :**

**1. Motivation :** Motivation plays an important role in all types of learning. No trial and error learning can take place without motivation. Motivation may appear in the form of need, desire, purpose or goal. Trial and error learning like any other type of learning is oriented to goal.

**2. Block or barrier :** There should be some block or barrier. If there is no blockage, there is no need of trial and error. Efforts must be made to remove the block.

**3. Random responses :** Random responses are made in trial and error learning. By random responses, we mean the meaningless actions which do not solve the problem. But these responses are helpful to us as they help in knowing that such and such activities are not to be repeated. In the words of Prof. Dashiell, "Random responses help us in an indirect manner."

**4. Elimination of wrong responses :** There is progressive elimination of the superfluous, unsuccessful or wrong form of activity or responses.

**5. Chance success :** As a result of random movements, success comes by chance.

**6. Establishment of right responses :** In trial and error learning, there is integration and establishment of right responses by which goal is achieved. It is a stage of errorless performance.

**7. Achieving the goal :** Achievement of goal or attaining some sort of satisfaction is a last step in trial and error learning. Achievement of goal or attaining satisfaction is very important for learning anything.

**Woodworth's view :** The essentials of trial and error learning according to Prof. Woodworth are :

(1) A 'set' to reach a certain goal.

(2) No obvious way to reach the goal.

(3) Exploring the situation, finding possible leads and trying them, backing off when blocked in one lead, and shifting to another.

(4) Finding a good lead and reaching the goal.

**Cole's view :**

In the words of Cole if we see the facts according to Thorndike, we can break up the learning into six facts :

(i) **Drive :** There should be strong drive or motive otherwise the learner will not work so enthusiastically.

(ii) **Block :** There should be some block or barrier. If there is no blockage, there is no need of trial and error learning. Efforts must be done to remove the block.

(iii) **Random movements** are made to reach the goal.

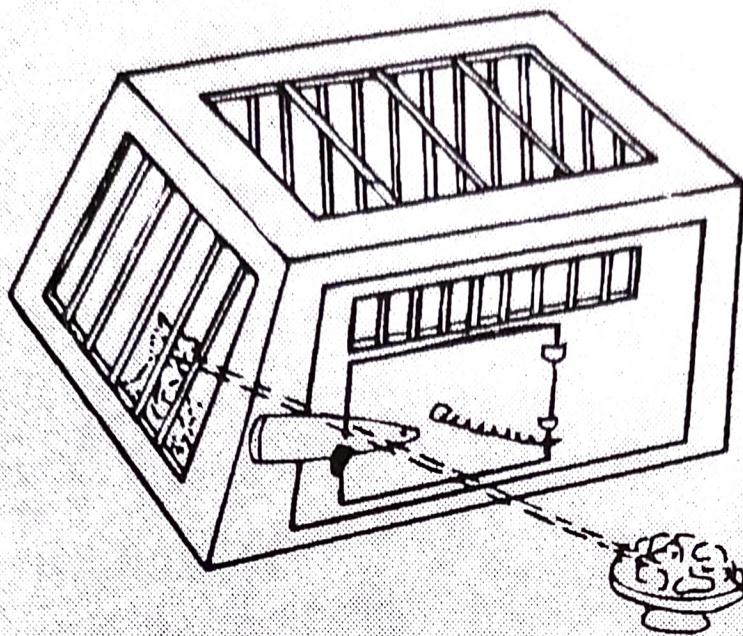
(iv) **Chance success :** As a result of random movements, success comes by chance.

(v) **Selection :** Random responses do not remain for long time because the learner selects the right responses after certain trials.

(vi) **Fixation :** Here right responses are fixed. It is a stage of errorless performance.

**Experiments :**

**1. Puzzle Box Cat experiment by Thorndike :** E.L. Thorndike studied the character of trial and error learning in a number of experiments on cats. He put a cat in the puzzle box with iron bars on the sides. On the floor of the box, was fixed a wooden slat which when pressed opened the door. A cat was placed inside the box and food was placed outside the box. The cat was kept hungry for 24 hours. The door of the puzzle box was closed. The cat could get food only if she learnt to press the slat which opened the door. The cat made several unsuccessful attempts of biting the iron bars, striking head against these, and finally it was successful in opening the door by pressing the slat. The same experiment was repeated several times and it was found that the cat in each successive attempt took less time in pressing the slat and opening the door.



*Fig. An illustration showing Thorndike's cat trying to come out.*

**2. Dog experiment by Loyd Morgan :** The dog was put into an iron cage, with a door not clearly visible. The dog made a number of attempts before he could open the door.

**3. Rat experiment by McDougall :** The rats were similarly confined in a small box with secret passage. After committing mistakes for 165 times, they succeeded in finding out the correct passage.

#### Trial and Error and Laws of Learning :

On the bases of trial and error theory Thorndike gave the following primary laws of learning which cooperate in trial and error learning :

**1. Law of readiness :** This law is also known as '*law of motivation*'. Woodworth calls it '*law of mental set*'. According to this law when we are ready to learn, we learn more quickly, effectively and with greater satisfaction than when we are not ready to learn.

**2. Law of exercise :** This law is known as '*Law of practice*' or '*Law of use and disuse*'. Practice makes a man perfect is a well known proverb :

(a) **Law of use :** "When a modifiable connection is made between a situation and a response, that connection's strength is, other things being equal, increased."

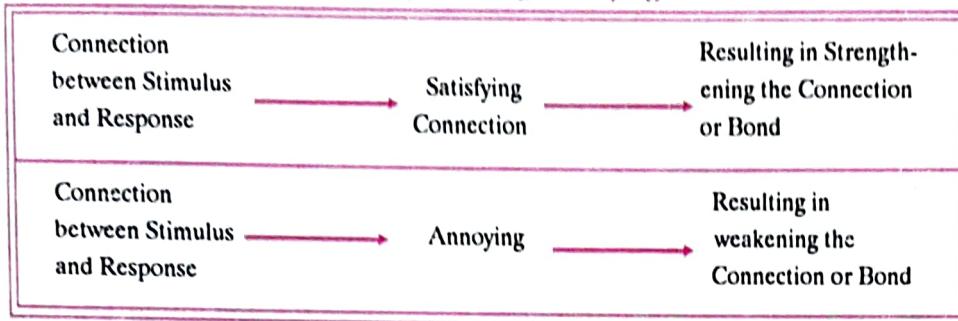
(b) **Law of disuse :** "When a modifiable connection is not made between a situation and a response over a length of time, the connection's strength, other things equal, decreases."

In brief, if any activity is repeated again and again, it is learnt effectively, and lack of repetition causes forgetfulness.

**3. Law of effect :** It is also called the "*Law of pleasure and pain*" or "*Law of satisfaction and annoyance*". Every activity has its effective tone. Some activities end in pleasure and others end in pain. The activities which are associated with pleasure or satisfaction tend to be repeated again and again and the learning becomes more effective. Activities which are associated with pain, punishment or annoyance are not repeated and their strength is decreased. Thorndike defines this law as follows :

*"When a modifiable connection between a situation and response is made and is accompanied by a satisfying state of affairs, that connection's strength is increased, but when made and accompanied by an annoying state of affairs its strength is decreased."*

Fig. showing Law of Effect : S-R Connection

**Secondary or Subsidiary Laws :**

- (1) Law of varied response or multiple response.
- (2) Law of previous beliefs, attitudes and opinions.
- (3) Law of partial activity.
- (4) Law of response analogy or assimilation.
- (5) Law of associative shifting.

(For Explanation Read Secondary Laws of Learning on Page 168)

**Educational Implications of Trial and Error Theory of Learning :**

**1. Importance of readiness :** Thorndike believes that readiness is preparation for action. It is essential for learning. If the pupil is ready to learn, he learns more quickly and effectively and with greater satisfaction than if he is not ready to learn. He warns us not to make the child learn till he is ready to learn and allow not to miss any opportunity of providing learning if the pupil is already prepared to learn.

**2. Importance of motivation :** Thorndike emphasised the importance of motivation in learning which was totally neglected before his time. Arousal of motivation makes the students ready for learning. Students must be properly motivated before they are taught.

**3. Importance of experience :** The theory recognises the importance of previous experiences. Understanding grows due to previous experiences. The best way to develop understanding is to develop a body of connections appropriate to that of understanding.

**4. Strengthening of bonds :** An important task of the teacher is to see what theories, principles and generalisations, etc. he likes to be remembered or forgotten by the students. Consequently, he must try to strengthen the bonds or connections between the stimuli and the responses which are to be remembered. This could be done through drill, repetition, practice and reward. For forgetting, he should make attempts to weaken the connections through disuse and annoying students.

**5. Importance of repetition :** For effective learning, more repetitions should be made. Students should follow the rule that "*practice makes a man perfect*". Forgetting takes place because of the law of disuse.

**6. Role of reward and punishment :** The theory (law of effect) recognises the role of rewards and punishments in learning. Getting reward as a result of some learning motivates and encourages the child to proceed on the same path with more intensity and enthusiasm while the punishment of any type discourages him and creates distaste and disatraction towards that learning. Thus the theory implies that :

(1) Mere repetition is of no use. Repetition becomes useful when the response is rewarded. In that case repetition strengthens the connections.

(2) Rewards have more strengthening effect than the corresponding weakening effect of punishments.

**7. Grading of the task :** Theory contributes the grading of the task from simple to complex. So teacher should proceed from simple to complex, known to unknown, concrete to abstract.

**8. Use of experiments :** Thorndike placed much emphasis on experimental verification. So the teacher should make use of experiments and learning by doing wherever possible for better and effective learning.

**LEARNING**

9. **Learnings of skills :** Various skills like sitting, standing, walking, running, cycling are learnt by trial and error.
10. **Scientific inventions :** Many scientific inventions, machines and improvements are the results of trial and error.
11. **Formation of habits and sentiments :** Habit formation is based on trial and error. Teachers and parents can form good habits and sentiments in the students on the basis of trial and error.
12. **Use in insightful learning :** Even in insightful learning, trial and error is involved.
13. **Transfer of learning :** Transfer in learning takes place because of identical elements in the two situations.

14. **Aids to improve learning :** Thorndike advocated the following aids of learning :

- (1) Attentiveness.
- (2) Interest in work.
- (3) Interest in improvement of work.
- (4) Problem solving attitude.

**Limitations of Trial and Error Theory :**

1. **Energy consuming :** The theory requires a good deal of energy because transfer of learning is minimum under trial and error.
2. **Random efforts :** It is not desirable to do random efforts because doing anything without insight is meaningless. The theory ignores the role of understanding, experience, discrimination and insight in learning.
3. **Emphasis on rote learning :** The theory over-emphasises the role of rote learning.
4. **Not much useful for bright students :** The theory may be useful for less intelligent and backward students but not much useful for bright and intelligent students.
5. **Not much useful for higher classes :** The theory is useful in case of students of lower classes, but for students of higher classes, the theory does not provide much guidance.

**(2) INSIGHT THEORY OF LEARNING (GESTALT THEORY OF LEARNING)**

Insight theory of learning is also known as Gestalt theory of learning. It is the product of German psychologists like Max Wertheimer, Kurt Koffka and Wolfgang Kohler. Kohler is the chief exponent of this theory. These psychologists are known as Gestalt psychologists. 'Gestalt' is a German word which means 'configuration' or simply an 'organised whole'. The theory grew out of the studies of perception.

According to insight theory, learning is not by random steps, learning is not by conditioning but by insight, introspection and understanding and the ability to see relationship among various factors involved. While learning, the learner always perceives the situation as a whole and after seeing and evaluating the different relationships takes the appropriate decision in an intelligent manner.

By placing apes and chimpanzees in their natural situations i.e., situations which they often come across in their routine life, Kohler shows the working of intelligence in them.

Kohler stressed that all learning takes place through insight. "Insight" means inner sight, seeing deep into the solution of the problem. According to Prof. Woodworth, "By insight is meant a good observation, perception of the situation as a whole or perception of those parts of the situation that provide a route to the goal." Insight according to Prof. Kohler involves "Foresight" as opposed to "Hindsight", as is found in trial and error.

(i) **Foresight :** Foresight is seeing the way to the goal before trying it.

(ii) **Hindsight :** Hindsight is observing that a lead is good or bad after trying it.

In trial and error learning, the animal makes a large number of responses (say R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> etc.) and per chance one of his response (say R<sub>4</sub>) comes out to be successful. Later on the animal looks back to the past reactions and selects the successful response (i.e. R<sub>4</sub>) and repeats it till it gets fixed up. Hence learning by trial and error involves use of "after thought" whereas in learning by insight, the problematic situation is viewed as a whole and the solution at once comes vividly before the mind in the form of "foresight". The right solution is foreseen before the action. Hence learning by insight involves foresight. The learner realises the truth of the maxim, "Look before you leap."

In learning by insight whole is more important than the parts. For meaningful organisation of objects, individuals apply different laws :

#### Laws of Pragnanz :

'Pragnanz' is a German word which means '*compact but significant*'. The law suggests that our psychological organisation tends to move in one general direction always towards *good gestalt* (i.e., Pragnanz). A good gestalt has the property of stability, simplicity and regularity. According to this law, we accept only those experiments which do not disturb our psychological organisation or equilibrium.

The following subordinate laws explain the significance of 'Pragnanz' :

**1. Law of similarity** i.e. similarity in form, shape, colour, size leads to meaningful organisation of the field: It is easier to learn similar things because similar stimuli have a greater tendency to be grouped together.

**2. Law of proximity or nearness**, i.e. things which are near to each other help in organisation. It implies that perceptual groups are formed according to nearness of parts. Hence we perceive all closely situated things or groups.

**3. Law of continuity**, i.e. good continuation helps in meaningful organisation.

**4. Law of closure** : It highlights that certain closed areas (of our mental make up) are more stable than the 'enclosed' ones. Hence, those closed areas readily form figures of perception. It is like Thorndike's law of effect. The individual feels satisfied only when the work is complete, otherwise he has tension.

Meaningful organisation gives rise to insight and ability to understand the situation as a whole.

#### Kohler's Experiments :

**1. Experiment with Sultan** : Kohler conducted experiments on chimpanzee. In some of the experiments the name of the chimpanzee was Sultan. In the first situation, Sultan was kept hungry and put in a room. A bundle of bananas was suspended from the ceiling of the room. Two wooden boxes were placed near chimpanzee. It was observed that the chimpanzee could not get the banana only by standing on one box. The position was such that if one box is put over the other only then chimpanzee could get the bananas. So chimpanzee tried this way and that way and thought over the whole situation. He kept one box over the other and then he was in a position to achieve the target. So by insight, he solved the problem.

**2. Experiment with two sticks** : Chimpanzee was put in a cage and two sticks were kept in the cage. The bananas were placed outside the cage. The sticks were such that if their ends could be joined together, they would become one. First the chimpanzee tried to get a banana kept outside the cage with the help of one stick but failed. Lastly, he joined two sticks and picked up the bananas. In this way, the chimpanzee got the bananas with the help of insight.

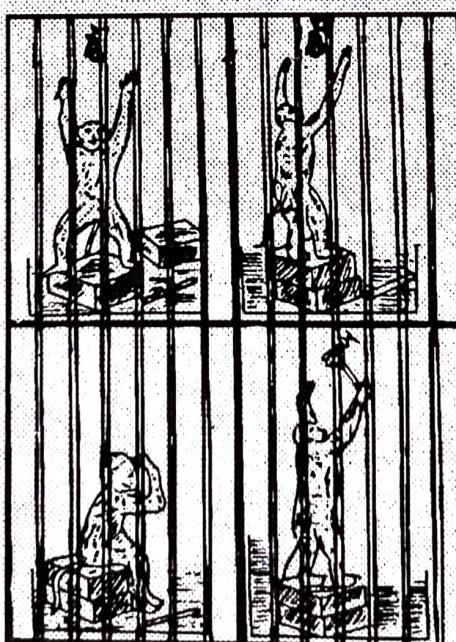


Fig. Kohler's experiment on chimpanzee.

**Criterion or Essentials of Learning by Insight :**

**1. Comprehension as a whole :** Learning by insight requires full comprehension of the situation as a whole.

**2. Clear goal :** The goal must be quite clear to begin with.

**3. Power of generalisation :** The learner must possess power of generalisation along with those of differentiation.

**4. Suddenness of solution :** Suddenness of the solution is the hall mark of learning by insight i.e., the solution flashes suddenly to the learner. No lengthy reasoning is involved.

**5. New forms of objects :** As a result of insight into the problem or situation objects appear in new forms and patterns.

**6. Transfer :** Transfer of learning occurs as a result of insight. The principles learnt in one situation are applied to the other situation.

**7. Change in behaviour :** Insight changes our behaviour to the extent which we have learnt through insight.

**Laws of Insight Formation :**

**1. Capacity :** Insight depends upon the capacity of the organism. Individuals differ in their capacities. The more developed is the individual, the more will be the capacity to develop insight.

**2. Previous experience :** Insight depends upon relevant previous experience and maturation. Some practice, trial and error and maturation upto the level is essential before insight develops. A child of five years cannot develop mathematical insight since he has not done sufficient practice in it.

**3. Experimental arrangement :** Development of insight depends upon experimental arrangement also.

**4. Fumbling and search :** Insight follows a period of fumbling and search.

**5. Readily repeated :** Insightful solutions can be readily repeated.

**6. Use in new situation :** Insight once achieved can be used in new situation.

**7. Wholesome experience :** Experience of insight is always wholesome. Whole is just not equal to its parts.

**Educational Implications of Learning by Insight (Role of Teacher in Insight Learning) :**

**1. Integrated curriculum :** The curriculum of the class should be an integrated whole i.e., there should be correlation between various subjects.

**2. Problem as a whole :** The whole problem is to be presented in the class. A piece meal approach will not develop learning by insight. This theory believes, "The whole is not a sum of the parts." The teacher should present the things in the class as a whole atleast to start with. To give a complete insight into the learning material, we should always proceed from whole to the part. The lesson should form an integrated unit because insight is possible if the situation is perceived as a whole.

(1) The whole sentence should be presented first and then analysed into words or letters.

(2) While teaching Biology, the model of the whole body should be presented before the children and then the various parts and organs of the body should be emphasised.

(3) While teaching geography, we should start from the globe and then come down to country, state, district and city.

**3. Child as a whole :** Parents and teachers should see the child as a whole and in total setting. It is not wise to conclude on the basis of single act about the child's behaviour.

**4. Importance of motivation :** The theory stresses the importance of motivation in learning. Therefore, the teacher should motivate the students properly for insightful learning.

**5. Importance of transfer :** The theory also emphasises the importance of transfer of learning. Previous experiences are helpful in learning. Hence the teacher should encourage the students to make the best use of transfer of learning.

**6. Emphasis on intelligent learning :** The theory is economical in terms of human energy. It puts emphasis on insight and understanding rather than rote learning. So spoon feeding and cramming should be discouraged. There are no useless and random efforts. The teacher should encourage the students to learn by understanding and insight i.e., intelligence.

**7. Development of higher mental faculties :** Insight involves the maximum use of intelligence, therefore, learning by insight is helpful in developing and improving higher mental processes like thinking, imagination, reasoning, analytical ability, problem solving, creativity etc. The teacher has to view the situation as a whole and then decide the line of action.

**8. Problem solving approach :** Insight helps in solving problems through one's own efforts. This approach trains the child to solve his problems in life. Therefore, the teacher should make use of problem solving approach for better learning. He should prepare children emotionally and intellectually to solve the problem.

**9. Useful for difficult subjects :** The theory is specially useful for learning difficult subjects like science, mathematics and literature.

**10. Useful for scientific inventions :** The theory is very useful for scientific inventions and discoveries.

**11. Individual differences :** (a) The teacher should keep in mind the intelligence level, maturity and other types of individual differences. Intelligence plays a major role in learning by insight. The more intelligent a child is, the more he will learn through insight. The less intelligent child takes more time and makes more efforts to gain insight.

(b) Insight of the child should be carefully handled by the teacher. He should know that its development is related to the physical maturation of the child. He should present the problem keeping in view the *maturation* of the child.

**12. Logical presentation :** The teacher should present his lesson logically. He should proceed from 'simple to complex', 'concrete to abstract', 'empirical to rational' and 'psychological to logical'. The problems presented in the class should be linked with life so that the learners have the greatest benefit out of them.

**13. Persistent efforts :** It needs a lot of patience on the part of the teacher. Insight does not develop in the learner immediately. It needs persistent efforts.

**14. Goal-oriented approach :** The teacher should develop in the learner the purpose of striving towards a goal on the basis of child's experience. He should relate the topic taught to the experiences of the child and then lead him towards the goal.

**15. Multiple approach :** Ability of the learner and his past experiences play an important role in insight. Therefore, the teacher should adopt a multiple approach in learning in the following manner:

(i) **Planning lesson :** The teacher should plan his lesson appropriately.

(ii) **Providing experiences :** He should provide significant and meaningful experiences to the pupil.

(iii) **Bringing integration :** He should bring an integration between theory and practice.

#### Limitations of Learning by Insight :

**1. Involvement of trial and error :** In insightful learning, trial and error is involved. Difficult problems and tasks need trial and error before the success is achieved. Even the adults cannot solve the different puzzles just in the first attempt. Insight learning is only the end point of trial and error.

**2. Learning in children and animals :** In case of children and animals, most of the learning is due to trial and error and not due to insight. Even many slow learners need to be taught through other methods of learning.

#### Difference between Learning by Trial and Error and Learning by Insight :

Trial and Error Learning	Insightful Learning
1. Depends upon efforts of the learner.	1. Depends upon insight and intellectual level of the learner.
2. Main stress is on physiological efficiency.	2. Main stress is on brain functions or intellectual factors.

Trial and Error Learning	Insightful Learning
3. Based on sensory motor co-ordination.	3. Based on perception.
4. Little scope for transfer of training.	4. Much scope for transfer of training.
5. Available to all.	5. Confined to those with comparatively higher intellectual level.
6. More useful in case of mentally deficient and children.	6. More useful to adults and persons having good intelligence.

### (3) CLASSICAL CONDITIONING THEORY

Classical conditioning theory was put forward by Russian psychologist, Ivan Pavlov (1849-1936). There are various names of this theory: (1) *Pavlovian Conditioning Theory*, (2) *Conditioned Reflex Theory*, (3) *Conditioned Response Theory*, (4) *Substitution of Response Theory*, (5) *Respondent Conditioning*, (6) *S-type conditioning*, (7) *S-R Associationistic Theory*.

This theory was put forward by Pavlov and Watson. According to this theory learning takes place by conditioning. Conditioning implies the attachment or association of original response with the new artificial stimuli. In other words conditioning means modification of innate or natural response.

#### Experiments on Conditioning:

1. **Pavlov's Experiment on Dog:** Pavlov conducted an experiment on the dog. He used to ring the bell before giving food to the dog. He repeated this activity for several days under the similar conditions. When the food was placed before the dog and the bell was rung, the saliva would secrete in the mouth of the dog. After some days, it was observed that only the bell was rung, the food was not placed, but the saliva started secreting. It means that natural response saliva was obtained by artificial stimulus (bell) instead of giving food. Pavlov named it as the theory of conditioning, theory of learning by Conditioned Reflex/Conditioned Response.

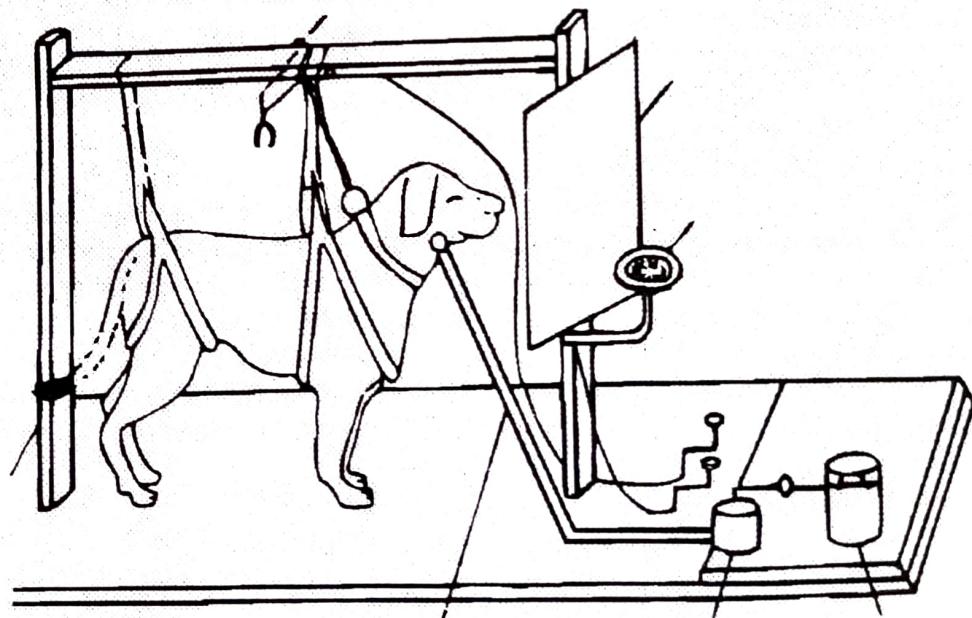
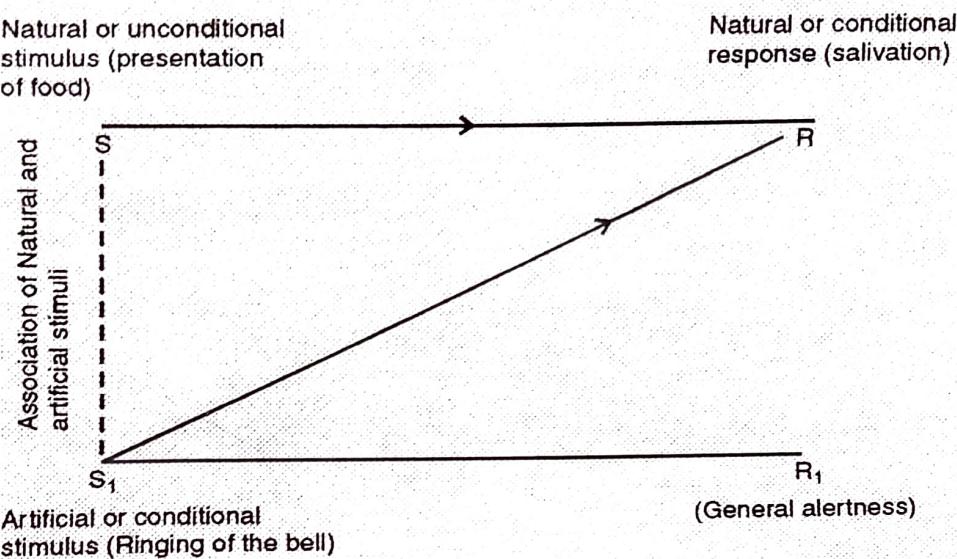


Fig. Diagrammatic view of the Experiment conducted by Pavlov.



*Fig. Showing Diagrammatic representation of Pavlov's Experiment.*

**Illustration :** A mother goes to the doctor's clinic for the treatment of his child who is suffering from high fever. After a thorough check of the child, the doctor advises the mother to get him injected. During injection, as the child feels the prick of the needle, he starts crying due to pain. The doctor advises the mother to come next day for another check-up of the day. This time also doctor injects the child and again the child cries due to pain. This process is repeated for a few days more. A day comes when the child starts crying merely at the sight of the doctor or at the sight of clinic or even one day the use of word 'doctor' at home may be sufficient to make the child cry. Thus the response of fear towards doctor develops in the baby.

In the above illustration two stimuli have affected the behaviour of the child :

(i) **Prick of the injection needle :** It is the stronger stimulus. It becomes the natural stimulus.

(ii) **Doctor :** Doctor is considered as the weaker stimulus. It becomes the artificial or the neutral stimulus.

When the child develops fear towards the doctor, it means that the response of the stronger stimulus has been substituted by the artificial or mental stimulus. Thus conditioning means modification of natural response. It means attachment or association of original response with the new stimuli.

**John Watson** (1878-1958), the father of behaviourism supported *Pavlov's* ideas on conditioned responses. Through his experiments Watson tried to demonstrate the role of conditioning in producing as well as eliminating emotional responses such as fear. His Rabbit Baby experiment is famous.

**Watson's Rabbit-Baby Experiment :** The experiment was made on a baby of 11 months. The baby was given a rabbit to play. The rabbit fur gave pleasure to the baby while he touched it. During the experiment, a loud noise to frighten the baby was produced the moment he touched the rabbit. The baby was frightened. This was repeated several times, till the baby got frightened by the rabbit, even without the frightening noise.

#### **Properties of Conditioned Response :**

1. **Specific :** Conditioned response is specific i.e., it can be evoked only with which it is conditioned. Other stimulus will not have any effect on it.

2. **Temporary :** Conditioned response is temporary and unstable i.e., it is not permanent activity. Its influence decreases after some time.

**3. Summation :** Conditioned response is based on summation i.e., if C.R. is conditioned with many stimuli and when all are presented simultaneously then the strength of conditioned response will increase.

**4. Dies through disuse :** Conditioned response dies through disuse.

**5. Age :** Conditioned response can be established more easily in case of children than in case of adults.

**6. Extinction :** If conditioned response is established with many stimuli then the extinction of any one will not make any effect on conditioned response.

#### Principles of Conditioning :

**1. Presentation of two stimuli :** In classical conditioning two stimuli are presented in quick succession i.e., one followed by the other immediately i.e., conditioned stimulus and unconditioned stimulus.

**2. Presentation of unconditioned stimulus :** Unconditioned stimulus must be presented after the conditioned stimulus otherwise there will be no conditioning.

**3. Strength of unconditioned stimulus :** Unconditioned stimulus must be stronger than the artificial stimulus.

**4. Repetition of the stimuli :** Both conditioned stimulus and unconditioned stimulus must be presented many times in order to establish conditioning.

**5. Relevant consistency :** There should be relevant consistency between the presentation of conditioned stimulus and unconditioned stimulus i.e., they must be given at the uniform rate.

**6. Reinforcement of unconditioned stimulus :** The natural (unconditioned) stimulus must be reinforced after a certain time i.e., if conditioning is established and for some trials unconditioned stimulus is not given, the strength of the conditioned stimulus will decrease.

**7. Extinction of CR :** After conditioning, if ringing the bell is not followed by presentation of meat (food) on several occasions, the dog may stop salivating. Pavlov named this process as 'extinction of CR' (conditioned response). Extinction may be defined as temporary forgetting of conditioned response.

**8. Spontaneous generalisation :** Pavlov discovered that if the dog is conditioned to one particular sound of bell, it would also give the response of salivation more or less to all sorts of bells. A child who develops a conditioned fear response in the school to a particular teacher may generalise this fear response towards other teachers also.

**9. Spontaneous recovery :** Pavlov brought the dog out of the experimental laboratory after extinction. After a gap of a few days, he again put the dog in the same experimental laboratory. Surprisingly, Pavlov found that there was spontaneous recovery of the extinguished response i.e. the dog once again salivated to the ringing of the bell.

**10. Stimulus differentiation :** If the dog is presented food (meat) after a particular sound of bell and is not presented food (meat) to other sounds of bell, the dog may develop stimulus differentiation i.e., it may salivate to a particular sound but will not salivate to other sounds of bell. Both stimulus generalisation and stimulus differentiation are contrary to each other.

**11. Intelligence :** Less intelligent children can be easily conditioned in comparison to more intelligent children. Pavlov advocated that intelligence and conditioning never go side by side. If intelligence works, conditioning will not take place and if conditioning takes place, intelligence will not work.

**12. Sex :** Conditioning takes place easily in case of girls in comparison to boys.

**13. Age :** Conditioning takes place easily in case of children in comparison to adults.

#### Factors influencing Conditioning (Conditioned Reflex or Response) :

**1. Motivation :** Conditioning (Conditioned reflex or response) is highly influenced by motivation. If the subject is motivated for conditioning, he will be conditioned easily. All learning is motivated learning. Hence motivation is essential for all types of learning. In Pavlov's experiment of dog, food is motivation

for the dog. If the dog is not kept hungry, he will not bother for the bell and even much for the food. Hence the individual should be properly motivated for learning.

**2. Repetition :** In the words of *Prof. Dashiell*, "Repetition is essential for the establishment of the conditioned response." If there are more repetitions of the conditioning process, there will be better conditioning. In *Pavlov's* experiment, the bell is rung again and again before giving food to the dog so that he may understand the necessary relationship between the bell and the food. If the bell is rung only once then the dog may not understand the relationship between the bell and the food. Moreover, the process of ringing the bell and giving food to the dog was repeated several times.

**3. Immediacy :** Conditioning is influenced by immediacy. In the words of *Prof. Murphy*, "Immediacy is necessary between the natural and artificial stimulus." In *Pavlov's* experiment the food is the natural stimulus and the bell is artificial stimulus. Food is given immediately after ringing the bell. If the time interval between the bell and the food is too much then the dog may not understand the relationship between the bell and food. Hence there may be no conditioning. Hence if artificial and natural stimuli is not given simultaneously, the conditioning may not take place.

**4. Age :** Children may be conditioned easily than adults.

**5. Mental health and intelligence :** Good mental health and high level of intelligence help in conditioned response or conditioning.

**6. External barriers :** Conditioning or the conditioned response will be delayed if there are external barriers (e.g., noise).

**7. Extinction :** Just as repetition of the pairing of the conditioned stimuli and the unconditioned stimuli strengthens the connections, similarly the presentation of the conditioned stimulus without its being followed by the unconditioned stimulus results in progressive diminution of the response. The dog no longer salivates at the sound of bell after the bell has been rung a certain number of times without being followed by food.

#### **Deconditioning (Extinction of Conditioned Reflex or Response) :**

Deconditioning means removing conditioned reflex or response. With the help of deconditioning, many irrational fears can be removed from the minds of children. The following points should be noted for the extinction of conditioned reflex or response (Deconditioning) :

**1. Lack of motivation :** If there is no motivation, there will be no learning by conditioning. If no food is given to the dog after ringing the bell, then the dog will not care for ringing the bell.

**2. Lack of repetition :** Conditioned response dies through disuse or lack of repetition. Lack of repetition causes deconditioning.

**3. Increase the time interval :** Conditioning will be removed if the time interval between the natural and the artificial stimulus is increased. In *Pavlov's* experiment, if the food is given after a long interval of ringing the bell, the dog may not establish link between ringing the bell and getting food.

**4. Removal of natural stimulus :** If natural stimulus (say food) is not given after the artificial stimulus (say ringing of the bell) then the strength of conditioned stimulus will decrease and there may be no conditioning.

#### **Educational Implications of Classical Conditioning Theory :**

**1. Language learning and concept formation :** Language can be learnt with the help of conditioning. Concept formation, during the early childhood period takes place as a result of conditioning. The techniques of using dolls, balls, cubes, pictures posters, flash cards, etc., for language learning and concept formation are based on conditioning. A picture of an elephant or a camel is presented before the learner and the teacher speaks out the word. But the child comes to recognise birds, animals, vegetables and fruits by their names on the basis of concept formation and learning.

**2. Theory of reward and punishment :** Theory of reward and punishment is based on conditioning i.e., bad deed should be associated with punishment and good one with relevant reward or praise. Rewards strengthen the behaviour and punishment weakens the behaviour. The desired behaviours of the

learners should always be associated with the rewards and their undesired behaviour should be associated with the punishment. Moreover, reward or punishment, should be given at the right time i.e., immediately after the desired or undesired behaviour.

**3. Formation of attitudes and sentiments :** Positive attitudes, sentiments, values and beliefs can be formed and developed with the help of conditioning. Most of the conditioning takes place in social environment. Therefore, parents and teachers should create healthy and favourable situations so that the children may develop positive and favourable attitudes and sentiments towards them and society.

**4. Formation of good habits :** Good habits can be formed with the help of conditioning. Habits of industriousness, punctuality, obedience, co-operation, sincerity, respect for elders and self-discipline etc. can be developed among children by using the procedure of conditioning.

**5. Elimination of negative attitudes and bad habits :** Unhealthy attitudes and bad habits like drinking, smoking, gambling can be broken with the help of 'Deconditioning'.

**6. Superstitions and phobias :** Superstitions and phobias can be deconditioned. For example, a child has developed superstition that by conditioning that when he sees a cat crossing the street, he gets punishment. Such superstitions can be removed through further conditioning (deconditioning). Let the child get no punishment on a number of times when a cat is made to cross his path. Thus superstitions, fears, phobias, anxiety, nervousness among children can be removed or minimised with the help of deconditioning.

**7. Liking and disliking for teacher and subject :** An individual may like or dislike an object or a person, if it is associated with good or bad effects. A teacher with unpsychological method of teaching or authoritative (harsh) behaviour may be disliked by the students. Students may develop a feeling of hatred towards the teacher as well as the subject due to conditioning. On the other hand, a teacher with effective and psychological methods of teaching and affectionate and friendly behaviour may be liked by the student. The students will develop a feeling of love, affection and liking towards the teacher.

**8. Principles of association :** Laws of association (contiguity or nearness, similarity and contrast, etc.) get practical application in the process of conditioning.

**9. Repetition (practice) :** Repetition helps in conditioning. Had the food not been repeated no learning would have taken place. Learning of physical sciences, biological sciences, social sciences, mathematics, language and skills need repetition or practice. Therefore, students must be given ample opportunities to revise and repeat their lessons.

**10. Use of audio-visual aids :** Conditioning emphasises the use of audio-visual aids in the teaching-learning process. The use of audio-visual aids can be made effective through conditioning. For example, if a word 'crow' is to be taught to the children in the class, then the picture of the 'crow' must be shown to them along with the word written on the blackboard. Children will speak that word after looking the picture. Then the picture is removed and the children will repeat only the written word. Thus the children could learn to speak the word 'crow' as a result of conditioning.

**11. Treatment of delinquent, problem and maladjusted children :** The theory also helps in the treatment of delinquent, problem and many other types of maladjusted children. This theory helps the teachers and psychologists to study the conditioned response of fear, phobia, anxiety or emotionally unstable children. Thus, the teacher can prepare a case and understand the morbid actions of the child.

**12. Useful in mental hospitals :** The mental cases and emotionally unstable children can best be treated with the process of conditioning. Conditioning plays an important role in the treatment of mental patients. *Moos Ward Atmosphere Scale* is pioneer in this regard. It states that on account of love, affection and good treatment many complexes and fears can be removed from the minds of such patients and such type of conditioning helps in their early recovery.

**13. Useful in adjustment :** Conditioning method is very useful for helping the children in making adjustment with the environment. The beginning of this takes place with the adjustment of the child in classroom conditions and school circumstances. Later on, he applies all this to make adjustment in real life challenging situations. It is the conditioning only that enables the child to make way in difficult and odd circumstances.

**14. Progress of culture and civilisation :** This theory is very useful for the progress of culture and civilisation. With the help of this theory, the child is able to learn many things in his early age.

#### (4) SKINNER'S OPERANT CONDITIONING THEORY

Behaviourist B.F. Skinner, an American Psychologist of Harvard University formulated theory of learning known as Operant Conditioning Theory. This theory is also known as *S-R Theory with Reinforcement*, *Contingency of Reinforcement Theory*, *Instrumental Conditioning Theory*, *R-Type Conditioning Theory of Learning*. Skinner called his theory as Operant Conditioning Theory because it is based on certain operations or actions which a person has to carry out. In Classical Conditioning Theory of Pavlov the dog performed no actions as it was passive—being tied on a table. The subjects of B.F. Skinner, on the other hand, were active. They performed certain actions, hence Operant Conditioning. Skinner's theory is called Reinforcement theory because reinforcement is the central concept in learning. In Operant Conditioning a response is followed by a response which reinforces the response. The behaviour is operant upon which the response is contingent. In this type of conditioning, the activity to be learnt is made to precede the occurrence of chosen event. Hence Skinner's Theory of Operant Conditioning is also called Contingency of Reinforcement Theory. Skinner's Theory of Learning is known as Instrumental Conditioning because in Operant Conditioning the activities of the subject become instrumental to effect the final response e.g., learning maizes avoiding punishments, learning specific activities leading to the same type of reward. Operant Conditioning may be represented as follows :

*Response → Reinforcement → Repetition → Instrumental Conditioning*

In this type of conditioning, the important factor is reward or punishment which reinforces the behaviour. Here the response or operant is strengthened and not the S.R. connections. Skinner attaches greater importance to operant behaviour which is primarily concerned with responses rather than stimuli, it is known as R Type conditioning. Skinner changed the usual S—R formula into R—S formula.

**R.S. Formula :** According to R—S formula, when a desired response is emitted, a reinforcing stimulus is presented. Thus a response is conditioned by constantly reinforcing it. The reinforcement must come after the response has been made and not before it. If the response is not reinforced, it results in the extinction of the response (operant). Thus Skinner was against 'No Stimulus No Response Theory.'

#### Respondent and Operant Behaviour :

Skinner distinguishes between the Respondent Behaviour and Operant Behaviour. Respondent Behaviour is that behaviour which is caused or elicited by known stimuli or events in the environment. Operant Behaviour is that emitted response which need not be associated with any known stimuli. This type of behaviour can be emitted by the individual and can be brought under stimulant control. *Respondent Behaviour is known as S-Type Conditioning and Operant Behaviour is known as R-Type Conditioning.*

#### Skinner's Operant Experiments :

**1. Experiment on rat :** Skinner developed his own method and apparatus to study operant conditioning. He developed a simple apparatus commonly known as Skinner Box. It is a simple box with a lever at one end. The pressing of the lever activates a food delivery mechanism. A hungry rat is placed inside the box. Initially the food pellets are delivered to the rat by pressing a lever from the outside by the experimenter. This step is necessary for the food reinforcement to be effective. Next the experimenter stops releasing food pellets. Rat is left alone in the box, it becomes hungry and begins to explore the box, accidentally presses the lever, a pellet of food is released and the rat eats it. The rat

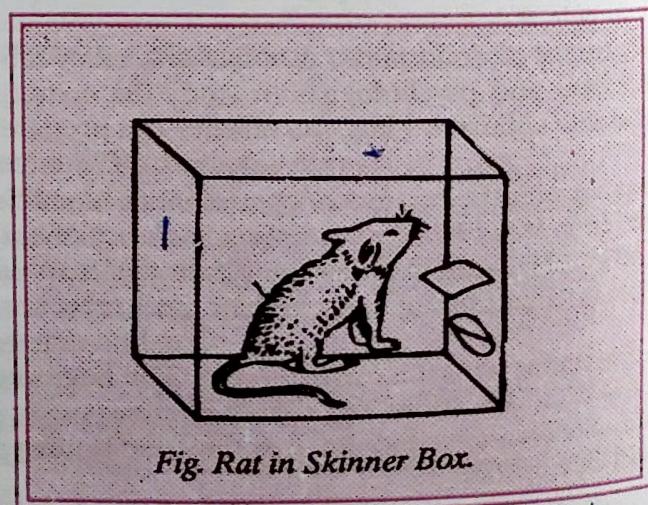


Fig. Rat in Skinner Box.