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FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL MANAGEMENT AND PLANNING

LEVEL II

ACADEMIC YEAR 2017-2018

MODULE: LEARNING PSYCHOLOGY: 10 Credits

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1. BRIEF DESCRIPTION OF AIMS

After going through this module, students will be able to:

- ❖ Understand the meaning of concept of learning
- ❖ Explain the concept & nature of learning.
- ❖ Explain the different types of learning curve.
- ❖ Describe the different stages of learning curve.
- ❖ Describe the different learning theories

2. LEARNING OUTCOMES

At the end of the module, students should be able:

- ❖ To understand characteristics, process of learning and Learning curve.
- ❖ To understand theories of learning
- ❖ To understand principles of different forms of learning
- ❖ To point out their implication to education

ASSESSMENT SCHEDULE

- Continuous Assessment during teaching
- Group assignments during teaching
- One partial exam during teaching
- A final exam at the end of the module

3. COURSE OUTLINES

CHAPI: INTRODUCTION

- Psychology of Learning
- Learning

CHAPII: NATURE OF LEARNING

- II.1. Characteristics of Learning
- II.2. Learning Curves

CHAPIII: THEORIES OF LEARNING

III.1. Behavioral Theories of Learning

Classical conditioning

Operant Conditioning

III.2. Cognitive Theories of Learning

Cognitive map and latent learning

Insight learning

III.3 Social Learning theory or observational learning

Bandura theory

Vigotsky theory

III.4. Constructivist Theories of Learning

III.5. Other forms of learning

CHAP IV: FACTORS INFLUENCING LEARNING

CHAPTER I: INTRODUCTION

Psychology of learning or **Learning Psychology** can be defined as a branch of Psychology which deals with the process of learning. This area is concerned with such problems as : How do children acquire skills? When is learning more effective? What are the factors that help the learning process? Etc. The main assumption behind all learning psychology is that the effects of the environment, conditioning, reinforcement, etc. provide psychologists with the best information from which they understand human behavior.

Learning

It is common to think of learning as something that takes place in school, but much of human learning occurs outside the classroom, and people continue to learn throughout their lives. Even before they enter school, young children learn to walk, to talk, and to use their hands to manipulate toys, food, and other objects. They use all of their senses to learn about the sights, sounds, tastes, and smells in their environments. They learn how to interact with their parents, siblings, friends, and other people important to their world. When they enter school, children learn basic academic subjects such as reading, writing, and mathematics. They also continue to learn a great deal outside the classroom. They learn which behaviors are likely to be rewarded and which are likely to be punished. They learn social skills for interacting with other children. After they finish school, people must learn to adapt to the many major changes that affect their lives, such as getting married, raising children, finding and keeping a job.

Because learning continues throughout our lives and affects almost everything we do, the study of learning is important in many different fields. Teachers need to understand the best ways to educate children. Psychologists, social workers, criminologists, and other human-service workers need to understand how certain experiences change people's behaviors. Employers, politicians, and advertisers make use of the principles of learning to influence the behavior of workers, voters, and consumers.

The term “learning” can be defined as acquiring knowledge or developing the ability to perform new behaviors. Psychologists say also that learning refers to a *relatively permanent change in behavior due to experience*. It seems obvious that a person’s behavior must change if they learn something but we don’t want to include all changes in behavior in our definition. First, **the change must be “relatively permanent.”** When a person gets hungry, they may start to eat. When they are full, they will usually stop. These are changes in behavior, but we don’t want to say that the person has “learned” to eat or stop eating several times each day. There are many temporary changes in behavior such as eating, sleeping, and getting angry, that we don’t qualify as learned behaviors. Since these are not “relatively permanent changes, our definition excludes them.

We also say that learned behaviors must be “due to experience?” Can you think of some behaviors that are relatively permanent but wouldn’t be qualified as learned? During their early years, children are not able to reach up objects held at greater heights but while they are growing up they will do so easily. This ability to reach to greater heights is a change in behavior and it is relatively permanent. This change isn’t learned, however. It is the result of maturation. By defining learned behaviors as resulting from experience, we exclude changes in behavior that are due to maturation, disease, drugs, or injury. These changes in behavior may be relatively permanent but we can’t say that they are learned.

To this end, learning can be described as a process by which an individual:

- Acquires a novel idea or experience to a situation;
- Retains and applies the idea, skills and knowledge in solving the confronting problems.
- Modifies one’s behaviour by the experience gained in the past and making the change permanent.

CHAPTER II: NATURE OF LEARNING

II.1 Characteristics of learning

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

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

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

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

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

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

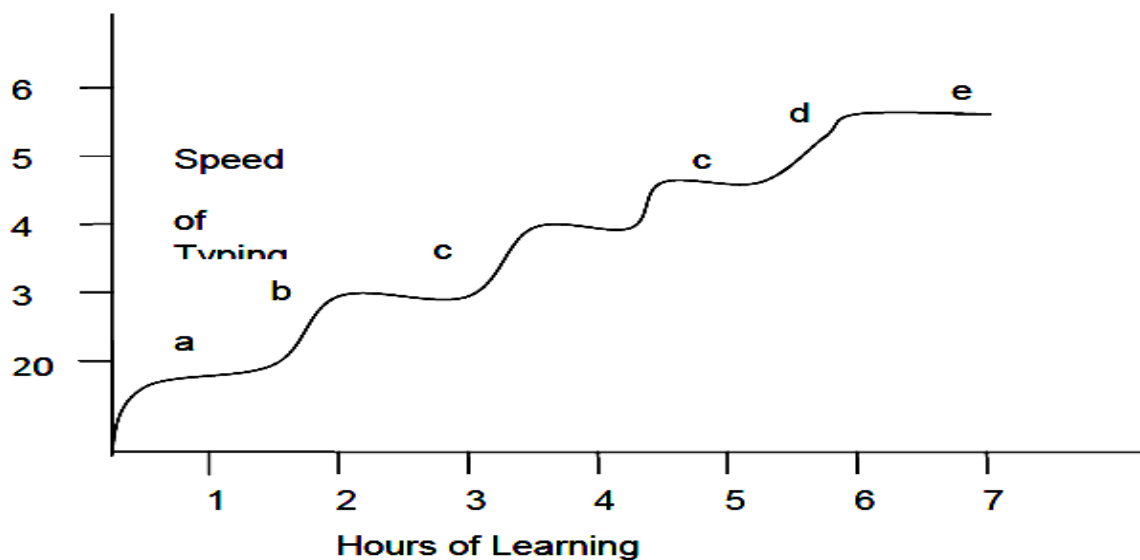
g. Learning is universal and continuous: All living creatures learn. Every moment the individual engages himself to learn more and more. Right from the birth of a child till the death, learning can be observed

h. Learning is responsive to incentives: In most cases positive incentives such as rewards are most effective than negative incentives such as punishments.

i. Learning depends on maturation and motivation: Whatever you want to learn cannot be effective unless you are mature enough to undertake that learning (maturation). Interest and motivation are important factors which facilitate the learning process

II.2 Learning curve

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



The above figure shows a typical learning curve of many types of learning. The curve consists of a number of irregularities, as the progress is not constant. For the convenience, the curve is divided into 5 stages: a, b, c, d and e.

II.2.1 Stages of Learning curve

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

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

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

What are the causes of plateau?

(i) The learner may be reorganizing the previous learning into a new pattern before further progress is possible.

(ii) Lack of progress may be due to decrease in motivation.

iii) The learner may have hit bad habits

(iv) The task may not be of uniform difficulty.

(v) Loss of interest.

(vi) The onset of fatigue is also one of the causes of a plateau.

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

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

II.2.2 Types of Learning Curve.

We get different types of learning curves depending upon

(a) The nature of the learner

(b) The nature of the task/learning material

(c) Time available.

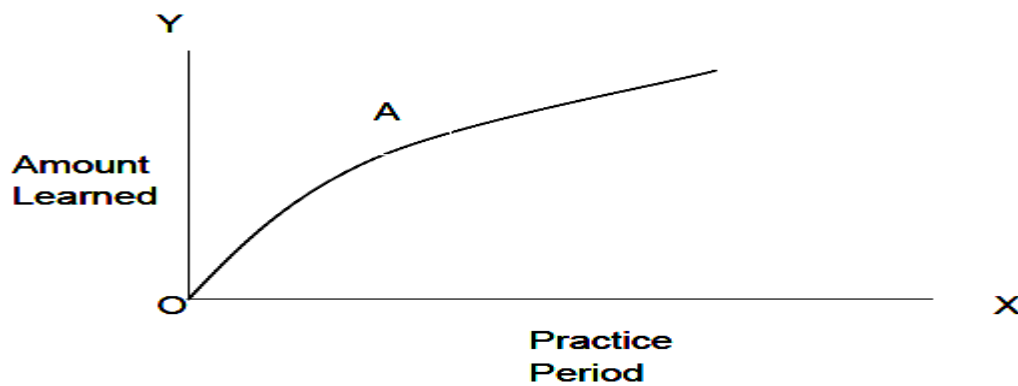
(d) Conditions under which the learning takes place.

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

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

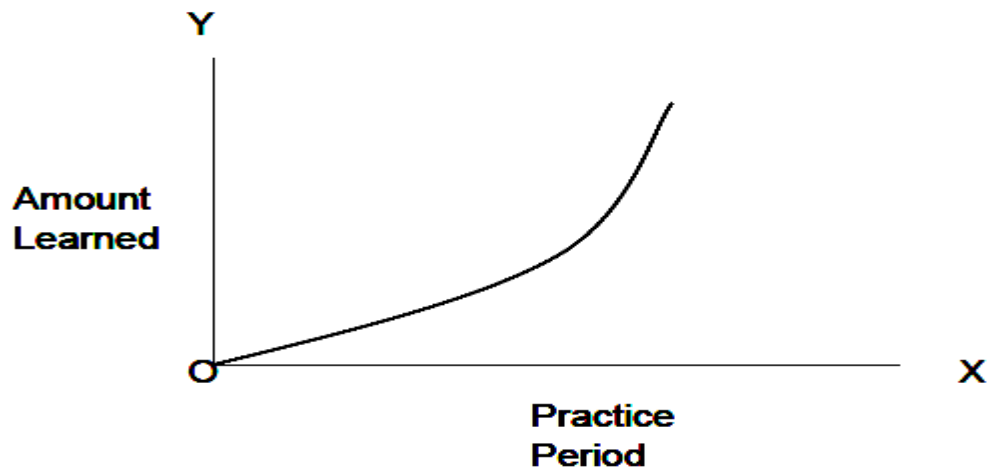
a. Convex curve

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



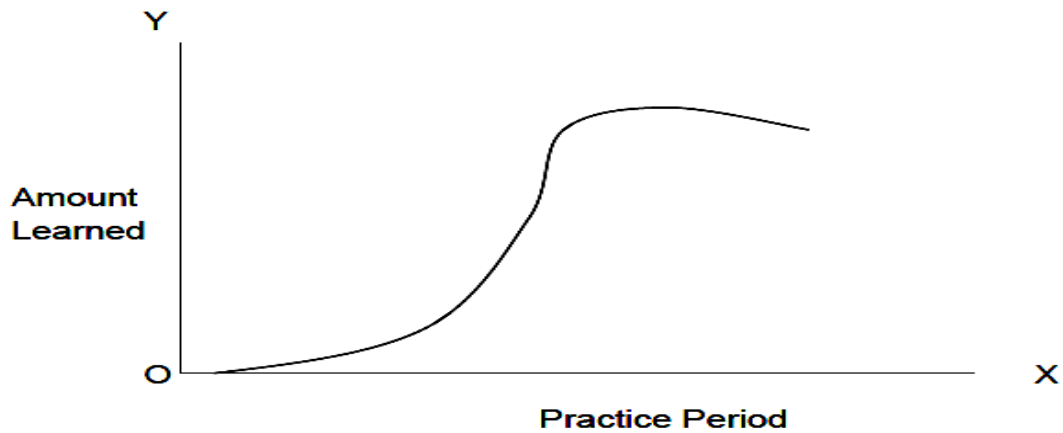
b. Concave curve

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



c. Combination of convex concave curve

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



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

II.2.3. Educational importance of learning curve

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

CHAPTER III: THEORIES OF LEARNING

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

We will notice that most Psychologists used animals in studying learning process because of important reasons: On one hand, there are experiments which cannot be conducted to humans because of ethical reasons. On the other hand the studies were conducted in the hope of better

understanding humans. The principles developed in studying simple processes in animals could of course be applied to humans. The three main categories or philosophical frameworks under which learning theories fall are behavioural, cognitive, and constructivist. Behaviourism focuses only on the objectively observable aspects of learning. Cognitive theories look beyond behaviour and explain brain-based learning. In addition, constructivism views learning as a process in which the learner **actively** constructs or builds new ideas or concepts.

III.1 Behavioral Theories of Learning

Behaviorism is a theory of animal and human learning that only focuses on **observable behaviors and discounts mental activities**. Experiments by behaviorists identify **conditioning as a universal learning process**. There are two different types of conditioning.

III.1.1 Classic conditioning (Learning through associating one stimulus with another)

Classical conditioning is a term used to describe learning which has been acquired through experience. Classical conditioning was discovered by accident in the early 1900s by Russian physiologist Ivan Pavlov. Pavlov was studying how saliva aids the digestive process. He would give a dog some food and measure the amount of saliva the dog produced while it ate the meal. After the dog had gone through this procedure a few times, however, it would begin to salivate before receiving any food. Pavlov reasoned that some new stimulus, such as the experimenter in his white coat, had become associated with the food and produced the response of salivation in the dog. Pavlov spent the rest of his life studying this basic type of **associative learning**, which is now called classical conditioning or Pavlovian conditioning.

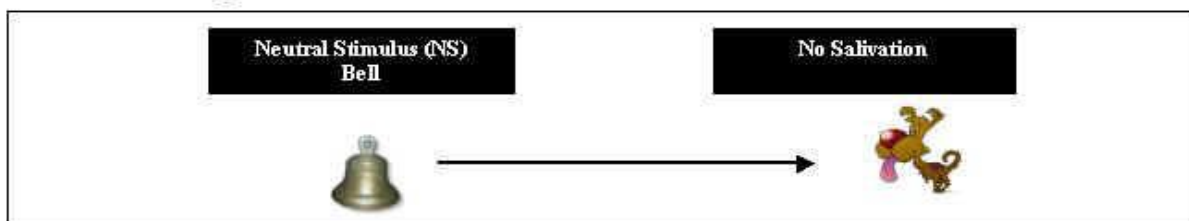
III.1.1.1. Pavlov's research

The conditioning process usually follows the same general procedure. Suppose a psychologist wants to condition a dog to salivate at the sound of a bell. Before conditioning, an ***unconditioned stimulus*** (food in the mouth) automatically produces an ***unconditioned response*** (salivation) in the dog. The term unconditioned indicates that there is an **unlearned, or inborn connection between the stimulus and the response**. During conditioning, the experimenter rings a bell and

then gives food to the dog. The bell is called the *neutral stimulus* because it does not initially produce any salivation response in the dog. As the experimenter repeats the bell-food association over and over again, however, the bell alone eventually causes the dog to salivate. The dog has learned to associate the bell with the food. The bell has become a *conditioned stimulus*, and the dog's salivation to the sound of the bell is called a *conditioned response*.

In summary the Pavlov experiments is presented as follow:

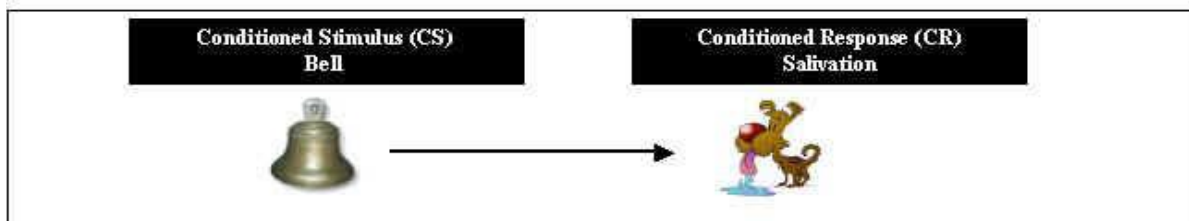
Before Conditioning



During Conditioning



After Conditioning



III.1.1.2. Principles of Classical Conditioning

Following his initial discovery, Pavlov spent more than three decades studying the processes underlying classical conditioning. He and his associates identified four main processes: acquisition, extinction, generalization, and discrimination.

a) Acquisition

The *acquisition* phase is the initial learning of the conditioned response. For example, the dog has learned to salivate at the sound of the bell. Several factors can affect the speed of conditioning during the acquisition phase. The most important factors are the order and timing of the stimuli. **Conditioning occurs most quickly when the conditioned stimulus (the bell) precedes the unconditioned stimulus (the food) by about half a second. Conditioning takes longer and the response is weaker when there is a long delay between the presentation of the conditioned stimulus and the unconditioned stimulus.** If the conditioned stimulus follows the unconditioned stimulus for example, **if the dog receives the food before the bell is rung conditioning will not happen again** that means the ringing of the bell itself will not produce the salivation.

b) Extinction

Once learned, a conditioned response is not necessarily permanent. **The term *extinction* is used to describe the elimination of the conditioned response** by repeatedly presenting the conditioned stimulus without the unconditioned stimulus. If a dog has learned to salivate at the sound of a bell, an experimenter can gradually extinguish the dog's response by repeatedly ringing the bell without presenting food afterward. Extinction does not mean, however, that the dog has simply unlearned or forgotten the association between the bell and the food. After extinction, if the experimenter lets a few hours pass and then rings the bell again, the dog will usually salivate at the sound of the bell once again. **The reappearance of an extinguished response after some time has passed is called *spontaneous recovery*.**

c) Generalization

After an animal has learned a conditioned response to one stimulus, it may also respond to similar stimuli without further training. If a child is bitten by a large black dog, the child may fear not only that dog, but other large dogs. This phenomenon is called *generalization*. Less similar stimuli will usually produce less generalization. For example, the child may show little fear of smaller dogs.

d) Discrimination

The opposite of generalization is *discrimination*, in which **an individual learns to produce a conditioned response to one stimulus but not to another stimulus that is similar**. For example, a child may show a fear response to freely roaming dogs, but may show no fear when a dog is on a leash or confined to a pen.

III.1.1.3. Application of classical conditioning

After studying classical conditioning in dogs and other animals, psychologists became interested in how this type of learning might apply to human behavior. In an famous 1921 experiment, American psychologist John B. Watson and his research assistant Rosalie Rayner conditioned a baby named Albert to fear a small white rat by pairing the sight of the rat with a loud noise. Although their experiment was ethically questionable, it showed for the first time that humans can learn to fear seemingly unimportant stimuli when the stimuli are associated with unpleasant experiences. The experiment also suggested that classical conditioning accounts for some cases of phobias, which are irrational or excessive fears of specific objects or situations. Psychologists now know that classical conditioning explains many emotional responses such as happiness, excitement, anger, and anxiety, that people have to specific stimuli. For example, a child who is used to see her mother coming with sweets at six o'clock after work, starts to smile just at that time even before seeing that someone is coming from outside.

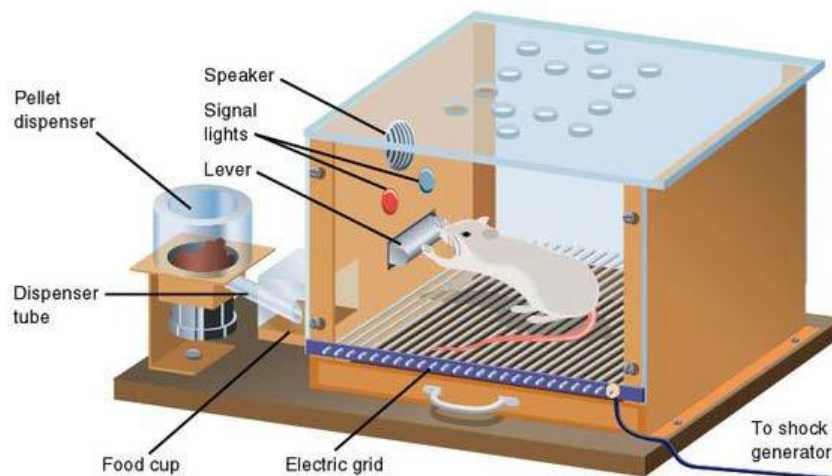
III.1.2. Operant conditioning (learning through consequences)

Operant conditioning (sometimes referred to as *instrumental conditioning* is a method of learning that occurs through rewards and punishments for behavior. Through operant conditioning, an association is made between a **behavior and a consequence for that behavior**. As behaviorists, Skinner and Thorndike believed that internal thoughts and motivations could not be used to explain behavior. Instead, he suggested, we should look only at the external, observable causes of human behavior. The term *operant* is used to refer to any “**active behavior that operates upon the environment to generate consequences**”.

III.1.2.1. Skinner and Thorndike's researches

1. B.F. Skinner ' research

American psychologist B. F. Skinner became one of the most famous psychologists in history for his pioneering research on operant conditioning. Beginning in the 1930s, Skinner spent several decades studying the behavior of animals (usually rats or pigeons) in chambers that became known as *Skinner boxes*.



The Skinner box involved placing an animal into a sealed box with a lever that would release food when pressed. If food was released every time the rat pressed the lever, it would press it more and more because **it learnt that doing so gives it food**. Lever pressing is described as **an operant behaviour**, because it is an action that results in a consequence. In other words, it operates on the environment and changes it in some way. The food that is released as a result of pressing the lever is known as **a reinforcer**, because it causes the operant behaviour (lever pressing) to increase.

2. Edouard Lee Thorndike and his Trial and Error Learning:

In his experiments, Thorndike put a hungry cat in a puzzle box. The box had one door, which could be opened by manipulating a latch of the door. A fish was placed outside the box. **The cat being hungry had the motivation of eating fish outside the box**. However, the obstacle was the latch on the door.

The cat made random movements inside the box indicating trial and error type of behaviour biting at the box, scratching the box, walking around, pulling and jumping etc, to come out to get the food. Now in the course of its movements, the latch was manipulated accidentally and the cat came out to get the food. Over a series of successive trials, the cat took shorter and shorter time, committed less number of errors, and was in a position to manipulate the latch as soon as it was put in the box and learnt the art of opening the door. Thorndike concluded that it was only after many random trials that the cat was able to hit upon the solutions. He named it as **Trial and Error Learning**. An analysis of the learning behaviour of the cat in the box shows that besides trial and error the principles of goal, motivation, explanation and reinforcement are involved in the process of learning by Trial and Error.

❖ **Laws of Learning**

Based on Trial and Error Learning Theory, Thorndike gave certain laws of Learning:

a) Law of Readiness

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

For a conduction unit ready to conduct, to conduct is satisfying.

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

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

Educational Implications of Law of Readiness:

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

b) Law of Exercise

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

Educational Implications

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

c) Law of Effect

This is most important of Thorndike’s laws, which state that when a connection between stimulus and response is accompanied by satisfying state, its strength is increased. On the other hand, when a connection is accompanied by an annoying state of affairs, its strength is reduced or weakened. The saying “nothing succeeds like success” goes very well with this law. In other words, the responses that produce satisfaction or comfort for the learner are strengthened and

responses that produce annoyance or discomfort for the learner are weakened. Thorndike revised this law in 1930 and according to this revision, he stated that reward strengthened the response but punishment did not always weaken the response. Then he placed more emphasis on the reward aspect than on the punishment aspect of Law of Effect.

Educational Implications

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

III.1.2.2. Principles of Operant Conditioning

Skinner identified a number of basic principles of operant conditioning that explain how people learn new behaviors or change existing behaviors. The main principles are reinforcement, punishment, shaping, extinction, discrimination, and generalization.

a) Reinforcement

In operant conditioning, *reinforcement* refers to any process **that strengthens** a particular behavior, that is, increases the chances that the behavior will occur again. There are two general categories of reinforcement, positive and negative. The experiments of Thorndike and Skinner illustrate **positive reinforcement**, a method of strengthening behavior by **following it with a pleasant stimulus**. Positive reinforcement is a powerful method for controlling the behavior of both animals and people. For people, positive reinforcers include basic items such as food, drink, and physical comfort. Other positive reinforcers include material possessions, money, friendship, love, praise, attention, and success in one's career.

Depending on the circumstances, positive reinforcement can strengthen either desirable or undesirable behaviors. Children may work hard at home or at school because of the praise they receive from parents and teachers for good performance. However, they may also disrupt a class, try dangerous actions, or start smoking because these behaviors lead to attention and approval

from their peers. One of the most common reinforcers of human behavior is money. Most adults spend many hours each week working at their jobs because of the paychecks they receive in return. For certain individuals, money can also reinforce undesirable behaviors for example selling illegal drugs.

Negative reinforcement is a method of strengthening a behavior by **following it with the removal or omission of an unpleasant stimulus**. There are two types of negative reinforcement: escape and avoidance. In *escape*, performing a particular behavior leads to the removal of an unpleasant stimulus. For example, if a person with a headache takes an aspirin and the headache quickly disappears, this person will probably use the medication again the next time a headache occurs. In *avoidance*, people perform a behavior to avoid unpleasant consequences. For example, to take an umbrella when it is raining so that you cannot be wet, citizens may pay their taxes to avoid fines and penalties, and students may do their homework to avoid detention.

❖ Reinforcement Schedules

A *reinforcement schedule* is a rule that specifies **the timing and frequency of reinforcers**. In his early experiments on operant conditioning, Skinner rewarded animals with food every time they made the desired response. This schedule is known as ***continuous reinforcement***. Skinner soon tried rewarding only some instances of the desired response and not others, and this schedule is said to be a ***partial reinforcement***. To his surprise, he found that animals showed entirely different behavior patterns.

Skinner and other psychologists found that partial reinforcement schedules are often more effective at strengthening behavior than continuous reinforcement schedules, for two reasons. First, they usually produce more responding, at a faster rate. Second, a behavior learned through a partial reinforcement schedule has greater resistance to extinction. If the rewards for the behavior are discontinued, the behavior will persist for a longer period of time before stopping. One reason that extinction is slower after partial reinforcement is that the learner has become accustomed to making responses without receiving a reinforcer each time. There are four main

types of partial reinforcement schedules: fixed-ratio, variable-ratio, fixed-interval, and variable-interval. Each produces a distinctly different pattern of behavior.

On a *fixed-ratio schedule*, individuals receive a reinforcer each time they make a **fixed number of responses**. For example, a factory worker may earn a certain amount of money for every 100 items assembled. This type of schedule usually produces a stop-and-go pattern of responding: The individual works gradually until receiving one reinforcer, then takes a break, then works steadily until receiving another reinforcer, and so on.

On a *variable-ratio schedule*, individuals must also make a number of responses before receiving a reinforcer, but the **number is variable and unpredictable**.

On a *fixed-interval schedule*, individuals receive reinforcement for their response only after a **fixed amount of time** elapses. For example, in a laboratory experiment with a fixed-interval one-minute schedule, at least one minute must elapse between the deliveries of the reinforcer. Any responses that occur before one minute has passed have no effect. On these schedules, animals usually do not respond at the beginning of the interval, but they respond faster and faster as the time for reinforcement approaches.

Variable-interval schedules also require the passage of time before providing reinforcement, but the amount of time **is variable and unpredictable**. Behavior on these schedules tends to be regular, but slower than on ratio schedules.

b) Punishment

Whereas reinforcement strengthens behavior, ***punishment weakens it***, reducing the chances that the behavior will occur again. As with reinforcement, there are two kinds of punishment, **positive** and **negative**. ***Positive punishment*** involves reducing a behavior by **delivering an unpleasant stimulus if the behavior occurs**. Parents use positive punishment when they hit or shout at children for bad behavior. Societies use positive punishment when they fine or imprison people who break the law. ***Negative punishment***, also called omission, **involves reducing a behavior by removing a pleasant stimulus if the behavior occurs**. Parents' tactics of

grounding teenagers or taking away various privileges because of bad behavior are examples of negative punishment.

Considerable controversy exists about whether punishment is an effective way of reducing or eliminating unwanted behaviors. Careful laboratory experiments have shown that, when used properly, punishment can be a powerful and effective method for reducing behavior. Nevertheless, it has several disadvantages. When people are severely punished, they may become angry, aggressive, or have other negative emotional reactions. They may try to hide the evidence of their misbehavior or escape from the situation, as when a punished child runs away from home. In addition, punishment may eliminate desirable behaviors along with undesirable ones. For example, a child who is blamed for making an error in the classroom may not raise his or her hand again. For these and other reasons, many psychologists recommend that punishment be used to control behavior only when there is no realistic alternative.

c) Shaping

Shaping is a reinforcement technique that is used to teach animals or people behaviors that **they have never performed before**. In this method, the teacher begins by reinforcing a response the learner can perform easily, and then gradually requires more and more difficult responses. For example, to teach a rat to press a lever which is over its head, the trainer can first reward any upward head movement, then an upward movement of at least one inch, then two inches, and so on, until the rat reaches the lever. Psychologists have used shaping to teach children with severe mental retardation to speak by first rewarding any sounds they make, and then gradually requiring sounds that more and more closely resemble the words of the teacher. Animal trainers at circuses and theme parks use shaping to teach elephants to stand on one leg, tigers to balance on a ball, etc.

d) Extinction

As in classical conditioning, responses learned in operant conditioning are not always permanent. In operant conditioning, *extinction* is the elimination of a learned behavior by discontinuing the reinforcer of that behavior. If a rat has learned to press a lever because it receives food for doing so, its lever-pressing will decrease and eventually disappear if food is no longer delivered.

e) Generalization and Discrimination

Generalization and discrimination occur in operant conditioning in much the same way that they do in classical conditioning. In *generalization*, people perform a behavior learned in one situation and in other similar situations. For example, a man who is rewarded with laughter when he tells certain jokes at a bar may tell the same jokes at restaurants, parties, or wedding receptions. *Discrimination* is learning that a behavior will be reinforced in one situation but not in another. The man may learn that telling his jokes in church or at a serious business meeting will not make people laugh. Learning when a behavior will and will not be reinforced is an important part of operant conditioning.

III.1.2.3. Applications of Operant Conditioning

Operant conditioning techniques have practical applications in many areas of human life. Parents who understand the basic principles of operant conditioning can reinforce their children's appropriate behaviors and punish inappropriate ones, and they can use generalization and discrimination techniques to teach which behaviors are appropriate in particular situations. In the classroom, many teachers reinforce good academic performance with small rewards or privileges. Companies have used lotteries to improve attendance, productivity, and job safety among their employees.

Psychologists known as behavior therapists use the learning principles of operant conditioning to treat children or adults with behavior problems or psychological disorders. Behavior therapists use shaping techniques to teach basic job skills to adults with mental retardation. Therapists use reinforcement techniques to teach self-care skills to people with severe mental illnesses, such as schizophrenia, and use punishment and extinction to reduce aggressive and antisocial behaviors by these individuals.

III.2. Cognitive theories of learning

As we have said, behaviorist theories believed that all learning could be explained by the processes of conditioning means that association of two stimuli are enough to influence learning. But some kinds of learning are very difficult to explain using only conditioning. Although classical and operant conditioning plays a key role in learning, they constitute only a

part of the total picture. Cognitive theory of learning tells us that learning becomes more effective if mental processes such as reasoning, thinking, interest, etc, are taken into consideration.

1. Cognitive Maps and Latent Learning

Imagine that you are on the way to a friend's house. As you come around a corner, you find that a tree has fallen across the road. Your usual route to your friend's house is completely blocked. What do you do? Most likely, you quickly find another way to get to your friend's house. How could we give a scientific explanation of this behavior? Your method for getting to your friend's house is probably not just a series of linked right and left turns. More likely, it is a path across a map you keep in your head. This map is a kind of mental picture of how your town is laid out. When you find your usual route blocked, you consult this mental map and find a new way to get to the same place. This kind of internal representation of the real world is called a **cognitive map**.

Researchers in 1930 (Tolman & Honzik) did an experiment designed to test **latent learning** in rats. Two groups of rats were placed in a maze for little while each day. One group of rats received a food reward in a particular part of the maze. The other group received no food at all in the maze. The food-rewarded rats soon learned to run quickly through the maze to the food box. The rats that were not given food showed no signs of learning. Later, when the second group of rats discovered food in the food box, they began running directly to the food. They quickly became just as fast as the other group. Tolman and Honzik concluded that even though they were not rewarded with food during the first part of the experiment, they had developed a cognitive map of the maze. When the food became available, they used their cognitive map to find it quickly.

2. Learning by Insight

One type of learning that is not determined only by conditioning occurs when we suddenly find the solution to a problem, as if the idea just popped into our head. This type of learning is known as insight, *the sudden understanding of a solution to a problem*. The German psychologist

Wolfgang Köhler (1925) carefully observed what happened when he presented chimpanzees with a problem that was not easy for them to solve, such as placing food in an area that was too high in the cage to be reached. He found that the chimpanzee first engaged in trial-and-error attempts at solving the problem, but when these failed they seemed to stop and contemplate for a while. Then, after this period of contemplation, they would suddenly seem to know how to solve the problem, for instance by using a stick to knock the food down or by standing on a chair to reach it. Köhler argued that it was this flash of insight, not the prior trial-and-error that allowed the animals to solve the problem.

III.3. Social learning theory

Although classical and operant conditioning is important types of learning, people learn a large portion of what they know through observation. Learning by observation differs from classical and operant conditioning because it does not require direct personal experience with stimuli, reinforcers, or punishers. Learning **by observation involves simply watching the behavior of another person, called a *model*, and later imitating the model's behavior.**

Both children and adults learn a great deal through observation and imitation. Young children learn language, social skills, habits, fears, and many other everyday behaviors by observing their parents and older children. Many people learn academic, athletic, and musical skills by observing and then imitating a teacher. According to Canadian-American psychologist Albert Bandura, a pioneer in the study of observational learning, this type of learning plays an important role in a child's personality development. Bandura found evidence that children learn traits such as industriousness, honesty, self-control, aggressiveness, and impulsiveness in part by imitating parents, other family members, and friends.

There was a time that Psychologists thought that only human beings could learn by observation. Today, they know that many kinds of animals (including birds, cats, dogs, rodents, and primates) can learn by observing other members of their species. Young animals can learn food preferences, fears, and survival skills by observing their parents. Adult animals can learn new behaviors or solutions to simple problems by observing other animals.

3.1 Bandura Experiments

In the early 1960s Bandura and other researchers conducted a classic set of experiments that demonstrated the power of observational learning. In these experiments some children observed adults attacking an inflatable Bobo doll. The Bobo doll is an inflatable toy with weight in the bottom. It pops back up when it is knocked down. In a typical experiment, children in one group were playing quietly when an adult in the room went over to the Bobo doll and began attacking it. The adult beat on the doll for about ten minutes, kicking it, hitting it with a hammer, knocking it down, and sitting on it. During this performance, the adult also spoke out loud saying things like “Sock him in the nose,” and “Kick him.” The other group of children saw no aggressive behavior at all. One at a time, the children⁹ from both groups) were then taken into another room. This new room contained a number of attractive toys and another Bobo doll. In the new room, each child was told that the toys were being saved for other children and that he or she was not allowed to play with them. The child was then left alone and watched through hidden windows. The children who had seen the aggressive model were much more likely to attack the Bobo doll in the second room. Often, they attacked it in the same way as the adult had. They even repeated the phrases they had heard the adult use. They appeared to be modeling their behavior closely after the behavior of the adult. Bandura and his associates found that the children imitated the violent behavior of adults even when the adult violence they saw was on film. Bandura called this study and his findings observational learning, or modeling.

The figure below illustrate the experience.



There are several guiding principles behind observational learning, or social learning theory:

- ❖ The observer will imitate the model's behavior if the model possesses characteristics such as talent, intelligence, power, good looks, or popularity that the observer finds attractive or desirable.
- ❖ Learning is not purely behavioral; rather, it is a *cognitive* process that takes place in a social context.

The learner is not a passive recipient of information. Cognition, environment, and behavior all mutually influence each other. The relationship between these elements is called *reciprocal determinism*. A person's cognitive abilities, physical characteristics, personality, beliefs, attitudes, and so on influence both his and her behavior and environment. These influences are reciprocal, however. A person's behavior can affect his feelings about himself and his attitudes and beliefs about others. Likewise, much of what a person knows comes from environmental resources such as television, parents, and books. Environment also affects behavior: what a person observes can powerfully influence what he does. But a person's behavior also contributes to his environment.

- ❖ The observer will react to the way the model is treated and mimic the model's behavior. When the model's behavior is rewarded, the observer is more likely to reproduce the rewarded behavior. When the model is punished, an example of vicarious punishment, the observer is less likely to reproduce the same behavior.

Learning by observation involves four separate processes:

attention, retention, production and motivation.

Attention: Observers cannot learn unless they pay attention to what's happening around them. This process is influenced by characteristics of the model, such as how much one likes or identifies with the model, and by characteristics of the observer, such as the observer's expectations or level of emotional arousal.

Retention: Observers must not only recognize the observed behavior but also remember it at some later time. These processes depend on the observer's ability to code or structure the information in an easily remembered form or to mentally or physically rehearse the model's actions.

Reproduction: Observers must be physically and/intellectually capable of producing the act. In many cases the observer possesses the necessary responses. But sometimes, reproducing the model's actions may involve skills the observer has not yet acquired. It is one thing to carefully watch a circus juggler, but it is quite another to go home and repeat those acts.

Motivation: In general, observers will perform the act only if they have some motivation or reason to do so. The presence of reinforcement or punishment, either to the model or directly to the observer, becomes most important in this process.

Attention and retention account for acquisition or learning of a model's behavior; production and motivation control the performance. Human development reflects the complex interaction of the person, the person's behavior, and the environment.

3.2 Lev Vygotsky and Social Learning Theories

Social learning theories help us to understand how people learn in social contexts (learn from each other) and informs us on how we, as teachers, construct active learning communities. Lev Vygotsky (1962), a Russian teacher and psychologist, first stated that we learn through our interactions and communications with others. Vygotsky (1962) examined how our social environments influence the learning process. He suggested that learning takes place through the interactions students have with their peers, teachers, and other experts. Consequently, teachers can create a learning environment that maximizes the learner's ability to interact with each other through discussion, collaboration, and feedback. Moreover, Vygotsky (1962) argues that culture is the primary determining factor for knowledge construction. We learn through this cultural lens by interacting with others and following the rules, skills, and abilities shaped by our culture.

How Vygotsky Impacts Learning:

Curriculum: Since children learn much through interaction, curricula should be designed to emphasize interaction between learners and learning tasks.

Instruction: With appropriate adult help, children can often perform tasks that they are incapable of completing on their own. With this in mind, the adult must continually adjust the level of his or her help to the child's level of performance. This will not only produce immediate results, but also instills the skills necessary for independent problem solving in the future.

III.4. Constructivist theory of learning

Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences.

While facing a new learning, learners possess always an **already known**, that is a certain ideas about the notions to be learned and learners will interpret the new learning in function of the previous ones. The constructivist theory resulted from the works of Jean Piaget (1964) whose theory says that when **an individual is confronted to a given situation, he will mobilize a**

number of cognitive structures which he calls *operational designs* to find solution to the situation. The learning of operational designs is done through two complementary processes:

- Assimilation which is the process by which the individual incorporates information from the environment into the cognitive structure.

- Accommodation which transforms the cognitive structure of the individual in order to incorporate new elements of experience. In this case, knowledge or learning **is not given** but it is **being constructed** by the learner **through mental activities**

There are several guiding principles of constructivism:

1. Learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.
2. Meaning requires understanding **wholes** as well as parts. And parts must be understood in the context of wholes. Therefore, the learning process focuses on primary concepts, not isolated facts.
3. In order to teach well, we must understand the mental models that students use to perceive the world and the assumptions they make to support those models.
4. The purpose of learning is for an individual to construct his or her own meaning, not just memorize the right answers and repeat someone else's meaning.

III.5. Other forms of learning

Although psychologists who study learning have focused the most attention on classical conditioning, operant conditioning, cognitive learning and observational learning, they have also studied other types of learning, including language learning, learning by listening and reading, concept formation, and the learning of motor skills. These types of learning still involve the principles of conditioning, cognitive and observational learning, but they are worth considering separately because of their importance in everyday life.

❖ *Language Learning*

Learning to speak and understand a language is one of the most complex types of learning, yet all normal children master this skill in the first few years of their lives. The familiar principles of shaping, reinforcement, generalization, discrimination, and observational learning all play a role in a child's language learning. However, in the 1950s American linguist Noam Chomsky proposed that these basic principles of learning cannot explain how children learn to speak so well and so rapidly. Chomsky theorized that humans have a unique and inborn capacity to extract word meanings, sentence structure, and grammatical rules from the complex stream of sounds they hear. Although Chomsky's theory is controversial, it has received some support from scientific evidence that specific parts of the human brain are essential for language. When these areas of the brain are damaged, a person loses the ability to speak or comprehend language.

❖ *Learning by Listening and Reading*

Because people communicate through language, they can learn vast amounts of information by listening to others and by reading. Learning through the spoken or written word is similar to observational learning, because it allows people to learn not simply from their own experiences, but also from the experiences of others. For example, by listening to a parent or instructor, children can learn to avoid busy streets and to cross the street at crosswalks without first experiencing any positive or negative consequences. By listening to and observing others, children can learn skills such as tying a shoelace, swinging a baseball bat, or paddling a canoe. Listening to the teacher and reading are essential parts of most classroom learning.

Much of what we read and hear is quickly forgotten. Learning new information requires that we retain the information in memory and later be able to retrieve it. The process of forming long-term memories is complex, depending on the nature of the original information and on how much a person rehearses or reviews the information.

❖ *Concept Formation*

Concept formation occurs when people learn to classify different objects as members of a single category. For example, a child may know that a mouse, a dog, and a whale are all animals, despite their great differences in size and appearance. Concept formation is important because it helps us identify stimuli we have never encountered before. Thus, a child who sees an antelope

for the first time will probably know that it is an animal. Even young children learn a large number of such concepts, including food, games, flowers, cars, and houses. Although language plays an important role in how people learn concepts, the ability to speak is not essential for concept formation. Experiments with birds and chimpanzees have shown that these animals can form concepts.

❖ *Learning Motor Skills*

A *motor skill* is the ability to perform a coordinated set of physical movements. Examples of motor skills include handwriting, typing, playing a musical instrument, driving a car, and most sports skills. Learning a motor skill is usually a gradual process that requires practice and feedback. Learners need feedback from a teacher or coach to tell them which movements they are performing well and which need improvement. While learning a new motor skill, the learner should direct full attention to the task. Some motor skills, if learned well, can be performed automatically. For example, a skilled typist can type quickly and accurately without thinking about every keystroke.

IV. FACTORS OF LEARNING

A variety of factors determine an individual's ability to learn and the speed of learning. Important factors are maturation, perception, the individual's age, motivation, prior experience, fatigue, and intelligence. In addition, certain developmental and learning disorders can impair a person's ability to learn.

IV.1. Maturation

Maturation is an important factor that affects our learning. Maturation is growth that takes place regularly in an individual without special condition of stimulation such as training and practice. Learning is possible only when a certain stage of maturation is also reached. Exercise and training becomes fruitful only when a certain stage of maturation is attained. Maturation determines the readiness of the child for learning.

Learning will be ineffective if the child has not attained the required level of maturity. There are individual differences in maturation. This means the rate of maturation varies with individuals. There are individual differences in the capacity to learn at the same age level. This is because of the difference of maturation level. Specific skills are learnt by children easily who mature earlier than others. Rate of learning ability is closely related to the maturation of the cerebral cortex. Deterioration of cortical tissues in old age brings about declination in the learning ability. So it can be said that learning is not independent of maturation, but must be based upon a sufficient stage of growth. Learning is possible only when a certain stage of maturation is reached. However much we practice a six month old child with walking exercises, the infant cannot walk. The muscles have not matured enough for the infant to learn to walk. This particular learning is possible only when the nerves & the muscles have attained a particular stage of maturity & development. Practice is most productive when properly articulated with maturational level. It is very essential for the teachers to know the maturational level of the pupils.

IV.2. Attention and perception

Perception is the process through which a person is exposed to information, attends to the information, and comprehends the information. Perception is the mental process by which you get knowledge of external world. You receive innumerable impression through the sense organs. You select some of these and organize them into unit, which convey some meaning. The transformation of sensation into organized pattern is called as perception. Perception = sensation + Meaning. For example, eyes react to light and give us the knowledge of brightness, nose reacts to smell and give us the knowledge of pleasant or unpleasant smell, ear react to the sound of barking and gives us the knowledge of presence of a dog. Perception is an active state of mind in which it reacts on sensation and interprets it. The basis of perception is sensation.

Importance of Perception in Learning

Learning depends on an individual's precepts. If you are able to perceive a thing correctly then right learning will take place. Learning will proceed in a proper direction due to correct precepts.

Both sensation and perception play an important role in your learning. Sensations are the first impression so it has to be absolutely clear. Sensations give rise to perception and on that basis you get a proper understanding of an object, idea or an experience. Learning depends upon accurate and efficient perception and perception depends upon the sensation, which depends on the normal functioning of the sense organs. Thus perception is important for proper learning and understanding.

IV.3. Age

Animals and people of all ages are capable of the most common types of learning (habituation, classical conditioning, and operant conditioning). As children grow, they become capable of learning more and more sophisticated types of information. Swiss developmental psychologist Jean Piaget theorized that children go through four different stages of cognitive development. In the sensorimotor stage (from birth to about 2 years of age), infants use their senses to learn about their bodies and about objects in their immediate environments. In the preoperational stage (about 2 to 7 years of age), children can think about objects and events that are not present, but their thinking is primitive and self-centered, and they have difficulty seeing the world from another person's point of view. In the concrete operational stage (about 7 to 11 years of age), children learn general rules about the physical world, such as the fact that the amount of water remains the same if it is poured between containers of different shapes. Finally, in the formal operational stage (ages 11 and up), children become capable of logical and abstract thinking.

Adults continue to learn new knowledge and skills throughout their lives. For example, most adults can successfully learn a foreign language, although children usually can achieve fluency more easily. If older adults remain healthy, their learning ability generally does not decline with age. Age-related illnesses that involve a deterioration of mental functioning, such as Alzheimer's disease, can severely reduce a person's ability to learn.

IV.4. Motivation

Learning is usually most efficient and rapid when the learner is motivated and attentive. Behavioral studies with both animals and people have shown that one effective way to maintain

the learner's motivation is to deliver strong and immediate reinforcers for correct responses. However, other research has indicated that very high levels of motivation are not ideal. Psychologists believe an intermediate level of motivation is best for many learning tasks. If a person's level of motivation is too low, he or she may give up quickly. At the other extreme, a very high level of motivation may cause such stress and distraction that the learner cannot focus on the task.

IV.5. Prior Experience

How well a person learns a new task may depend heavily on the person's previous experience with similar tasks. Just as a response can transfer from one stimulus to another through the process of generalization, people can learn new behaviors more quickly if the behaviors are similar to those they can already perform. This phenomenon is called *positive transfer*. Someone who has learned to drive one car, for example, will be able to drive other cars, even though the feel and handling of the cars will differ. In cases of *negative transfer*, however, a person's prior experience can interfere with learning something new. For instance, after memorizing one shopping list, it may be more difficult to memorize a different shopping list.

IV.6. Intelligence

Psychologists have long known that people differ individually in their level of intelligence, and thus in their ability to learn and understand. Scientists have engaged in heated debates about the definition and nature of intelligence. In the 1980s American psychologist Howard Gardner proposed that there are many different forms of intelligence, including linguistic, logical-mathematical, musical, and interpersonal intelligence. A person may easily learn skills in some categories but have difficulty learning in others.

IV.7. Developmental Disorders

A variety of disorders can interfere with a person's ability to learn new skills and behaviors. Learning and developmental disorders usually first appear in childhood and often persist into adulthood. Children with attention-deficit hyperactivity disorder (ADHD) may not be able to sit still long enough to focus on specific tasks. Children with autism typically have difficulty

speaking, understanding language, and interacting with people. People with mental retardation, characterized primarily by very low intelligence, may have trouble mastering basic living tasks and academic skills. Children with learning or developmental disorders often receive special education tailored to their individual needs and abilities.

IV.8. Fatigue

It is quite essential to do away with fatigue in the process of learning as fatigue becomes an obstacle in the task to be performed or at least reduces its rate of progress. The truth of the matter is that the proportion in which the students becomes fatigued, his achievement curve shows a downward trend. Achievement decreases with the increase in fatigue.

Kinds of Fatigue

It is generally believed to be of four kinds.

a. Mental Fatigue: Mental work, or any kind of strain on the mind reduces the capacity of the mind for work and causes mental fatigue.

b. Physical Fatigue: This type of fatigue results in the reduction in the capacity of the muscles of the body and a feeling of fatigue. In this way physical fatigue is brought about by physical exertion. Even though the body feels tired due to mental exertion which should normally result in mental fatigue, yet on account of close relation of the two, it also produces physical fatigue. Thus mental fatigue is unavoidable and it lead to physical fatigue.

c. Nervous Fatigue: The subconscious mind of man is extremely active and since in the process of its work it consumes energy, in due course of time it naturally produces a feeling of fatigue and depression. Nervous fatigue can also be due to mental conflict.

d. Boredom: Boredom and fatigue are not identical. Fatigue is the result of the use of energy but boredom is the feeling of tiredness due to an incomplete or improper expulsion of energy. If you go to a friend and he is busy in some work you become bored. Similarly, you get bored if a person persists in talking about the same thing day after. Boredom result in restlessness, a state induced by our inability to find proper use for our capacity for work.

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