UNIT 2 WHAT IS LEARNING ?

Structure

2.1 INTRODUCTION

Learning is one of the most important and pervasive activities of human life. Since birth we are always learning something or the other. This includes language learning at a younger age, learning habits, skills, postures and gestures, likes and dislikes, preferences, knowledge, meanings, value systems and finally learning to adapt to diverse situations of life. In this Unit, attempts have been made to examine the nature of learning, how do people learn to perform simple, motor activities to complex mental and motor activities, how do they learn to express different types of emotions on different occasions, and the role of learning theories in explaining human behaviour.

2.2 OBJECTIVES

After going through this Unit, you should be able to:

● understand the concept of learning;

● differentiate learning from non-learning;

● explain different theories of learning; and

● synthesize various types of learning.

2.3 NATURE OF LEARNING

Let us consider the following day-to-day examples of learning:

1. Sunita was a student of grade four. She experienced considerable difficulty with a series of homework assignments in mathematics, particularly in subtraction. She was not able to solve two and three-digit subtraction problems correctly. One day, after her typical half an hour tantrum about "these stupid problems", her father explained that subtraction is nothing more than reversed addition. Something must have clicked in Sunita's head, because her father has not been subjected to any more tantrums about substraction.

2. A three-year-old boy is overly affectionate with a neighbourhood dog, and the dog responds by bitting the boy's hand. After that, the boy cries and runs to his mother whenever he sees the dog.

3. The mother of a nine-year-old boy, Sohan, insists that her son should bring milk daily from the milk booth. In turn, mother gives him some money. The money, when saved for two or three weeks, enables the boy to purchase things of his own choice. As a result, he develops an appreciation for the value of money.

On the basis of above example, can you describe the nature of learning? One thing is clear that learning refers to the change in behaviour. There was an observable change in Sunita's behaviour as she did not disturb her parents for solving subtraction problems afterwards. It is also clear from the above examples that the change in behaviour due to learning is relatively permanent. That is, the change in behaviour is neither for the time-being (shorter duration) nor it is necessary that it will be forever. The change will last for some period of time. It is also possible that the change in behaviour may not be reflected immediately after learning.

In the third example, the mother wanted to inculcate some household responsibilities in the child. For this, she rewarded each time the milk bringing behaviour of the child. It means that change in behaviour is due to practice. Furthermore, in order to bring the desired change in behaviour it is essential that reinforcement is given each time the child exhibits the desired change in behaviour.

In behavioural terms, **learning can be described as establishing association between stimulus and response**. For example, the teacher shows the picture of an apple to the child and asks what is this? The child does not know the answer.

The teacher says... ... This is an apple. After the repeated presentation of the picture (the stimulus) and word 'apple' (response), the child learns to associate picture with the word. Each time the child is able to associate picture with the words, the teacher gives him reinforcement, such as, praise, toffee, etc.

2.4 WHAT IS NOT LEARNING?

All human/animal behaviours are not learned, nor does their expression require any effort on the part of the individual. Very simple behaviours are known as **reflex actions**, for example, sneezing when something enters in the nose, sudden withdrawal of hand when it accidentally touches a hot plate, increase in heart beat while climbing, etc. These are **innate behaviours**.

Few complex behaviours, known as **instincts**, are also innate. The examples of instinctive behaviour are nest building by birds, migration of birds from one place to another in a particular season, hibernation and mating behaviour. Instinctive behaviours are species specific.

There are certain changes in the behaviour that can be associated with the normal growth of individuals and are related to **maturation**. A child saying his/her first word at the age of 18 months is generally due to maturation. His/her ability to walk is maturational, his/her skill at high jump is learnt; ability to sense is maturational, knowing where to push so the door opens is learning. But the language that he/she learns to speak is the result of a specific environment. It is, however, very difficult to discriminate between the two in practical situations. The complexity of changes are the result of the interaction between maturation and learning. Forcing a child to learn speech patterns before a certain maturation level can disrupt his/her normal development. On the other hand, failure to provide appropriate teaching in speech may become an educational error on the part of the teacher. Therefore, learning is not behaviour emerging as instincts or as a result of maturation.

2.5 THEORIES OF LEARNING

Before discussing the different explanations or theoretical viewpoints of learning, let us first examine the following definitions of learning:

- Learning is a relatively permanent change in behaviour due to experience.
- Learning is a relatively permanent change in mental association due to experience.

Can you describe as to what is common in both the definitions? You can see that in both definitions learning has been characterized as a relatively permanent change; in other words, the change will last for some period of time, although not forever. Also, both definitions attribute that change to experience; that is, learning takes place as a result of some event in the learner's life.

Despite these similarities, you will, however, notice that the first definition emphasizes on change in behaviour, an external change that can be observed. The definition reflects the perspective of a group of theories collectively known as **behaviourism**. These theories focus on the learning of tangible, observable behaviour, or responses, such as solving a subtraction problem, running to the mother after seeing a dog, expressing different types of emotions on different occasions, or complaining about a stomachache to avoid going to school.

The second definition focuses on a change in mental associations – an internal change that cannot be observed. This definition reflects the perspective of a group of theories collectively known as **Cognitive theories**. These theories focus on the thought processes (or mental events) involved in human learning rather than on behavioural outcomes, e.g., the way a child interrelates addition and subtraction facts; the memory gimmick a child uses to remember difficult words and the idiosyncratic meaning a child attaches to his/her understanding of basic physics principle. We will discuss the essential characteristics of each viewpoint in detail

2.5.1 Behaviouristic View

The first psychological perspective to have a significant impact on our understanding of how human beings learn was behaviourism. In the preceding para, we have seen that behaviourist, organisms enter the world as "blank slates" (the assumption of tabula rasa). That is, environment plays an important role in shaping the personality characteristics of individuals. Therefore, rather than using the term learning, behaviourists often talk about conditioning; an organism is conditioned by environmental events. What is learned, being largely the result of one's past and present experience, is often beyond an organism's control. It can be further mentioned that conditioning is a specific term used to describe the process of behavioural change. It is of two types: (1) classical conditioning, and (2) instrumental or operant conditioning. Here, we shall try to understand the basic differences between classical and operant conditioning.

Classical conditioning

1. Amit is a student of Class V. He received several painful bee-stings when he was young. Now whenever a bee flies near Amit, he screams, waives his arms frantically, and becomes mad. Though he knows that he would be perfectly better off if be remained still, but somehow he just can't control himself.

2. Neha was admitted to Class III about a month ago. After joining the class, she found that her maths teacher is very tough, scolds the children and beats them very often. Once Neha was also subjected to this treatment. Thereafter, it has so happened that whenever her maths teacher enters into the class, Neha become nervous even if she is not scolded or beaten by the teacher.

If you carefully analyse both the examples, you will find that past experience plays an important role in determining what the individual will learn. And once the organism has experienced that situation, on the next occasion the sight of the situation produces that response in the organism. A child after returning home from school becomes very happy to know that his father has returned home from work early. Because on earlier occasions whenever his father came home early, he brought some good sweets to eat. As a result, the child has associated early return of his father with sweets.

An experiment on classical conditioning was for the first time conducted by Pavlov on dogs. Pavlov's experiment can be understood with the help of the following diagram:

Step 1: (a) : Neutral (Bell) stimulus, ⟶ No response

(b) : Unconditioned (food) stimulus ⟶ Unconditioned Response (Salivate)

Step 2: Association of (a) and (b)

Step 3: Conditioned stimulus ⟶ conditioned response
(Bell) (Salivate)
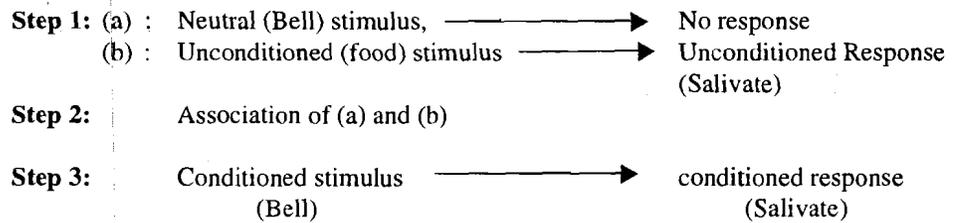
If you present the sound of a bell (Neutral stimulus) to the animals, such as dog, it will not care for it. Second time, you present the sound of the bell and food (Unconditioned Stimulus: UCS) together to a hungry dog. What do you see? You will find that the dog salivates because food is present before him. You may repeat this procedure for a number of times, and each time you will get the same response. Thereafter, if you only present the sound of the bell, you will see that the dog salivates. You may ask a question, why? The answer is very simple. Because of the association of the sound of the bell with food, the dog has learnt to respond to the sound of the bell. But remember, the dog treats the sound of the bell as an indicator for food. If on several occasions, when the food is not presented with the sound of the bell, after some time dog will not respond to the bell sound. This is known as **extinction** of the learned behaviour, i.e., withholding of unconditioned stimulus reduces the probability of conditioned response.

There are few other characteristics of classical conditioning, namely, spontaneous recovery, stimulus generalization and stimulus discrimination. **Spontaneous recovery** is the recurrence of a conditioned response when a period of extinction is following by a rest period. In our earlier example, if Amit gets an opportunity to be near lots of bees for a period of time, he would eventually settle down and regain his composure. However, his first response on later encounter with a bee would be to fly off the hand once again.

You may probably have experienced that after being conditioned to fear of a white rat, the person becomes afraid of a rabbit, a dog, a fur coat and cotton wool. **When individuals respond to other stimuli in the same way and they respond to conditioned stimuli, stimulus generalization is occurring.** The more similar a

stimulus or object is to the conditioned stimulus, the greater the probability that stimulus generalizations will occur. But in certain cases we also make discrimination between the objects/stimuli. A child who is abused by his/her father, simultaneously has positive interactions with other adult men, he/she is not as likely to generalize the fear of his/her father of those other individuals.

Operant Conditioning

In operant conditioning increase or decrease in the likelihood that behaviour will occur is affected by delivery of a rewarding or punishing event after the behaviour occurs. It is usually voluntary, not reflex like as in classical conditioning. In the case of classical conditioning, we have seen that when food is presented, the organism responds to it (i.e., salivate). It means that the reward makes an individual active. It may also mean that individuals are passive enough to wait for the situation in which reward will automatically come to them they themselves will not do any thing to get the reward. We, however, know that the later proposition is not true for higher order organisms including human beings. We actively operate upon the situation so as it becomes rewarding. In case of classical conditioning, the behaviour is elicited by stimulus while in operant conditioning the behaviour is emitted by the organism. In the first case, reinforcement is a condition for behaviour while response is followed by reinforcement in the latter.

B.F. Skinner, a noted behaviourist, gave the model of operant conditioning. Skinner conducted his experiments on rats. Rats when placed in a box, could press the lever and thus open the door of the box, come out of box and eat food. On the first attempt, the rat does not know what to do. As a result, it jumps in the box several times and by chance when it falls on the lever the door is opened. Slowly and slowly, the rats learnt that in order to get food they need to press the lever. According to Skinner, a response that is followed by a reinforcer is strengthened and is, therefore, more likely to occur again. In other words, responses that are reinforced tend to increase in frequency. Because a response increase is a change in behaviour, a behaviourist would assume that reinforcement brings about learning. Skinner found that rats will learn to press metal bars and pigeons will peck at round plastic discs to get pellets of food. Likewise, Tina will increase her house-keeping behaviour if it allows her to see a friend and Sohan will do just about anything if the price is right. The infant will smile and respond more if it gains the attention and approval of adults around her.

Since the theory of operant conditioning is totally based upon **reinforcement,** it would be appropriate if we discuss the salient characteristics of reinforcement. So far, we have been using the terms reward and reinforcement interchangeably. Now we will avoid using the term reward for the reason that the word reward implies that the consequence following a behaviour is somehow both pleasant and desirable. Pleasantness and desirability are subjective judgments, which a behaviourist tries to avoid.

We can say that reinforcer is a stimulus that increases or decreases the frequency of a response it follows. Reinforcers are of two types: primary and secondary. **Primary reinforcers,** such as, food, water, sleep and temperature, etc., are themselves sufficient enough to elicit a response. **Secondary reinforcers,** when paired with primary reinforcers, take on the reinforcing properties of their own, such as, praise, smile and other signals of approval. We had seen in classical conditioning how a neutral stimulus can take on reinforcing properties of a primary reinforcer.

Depending upon the administration of reinforcement, four different procedures of reinforcement have been identified. They are: positive reinforcement, negative reinforcement, punishment, and extinction. A positive reinforcement is something which when added to the situation by a certain response, increases the probability of occurrence of that response. A child's independent play is said to be reinforced when it increases as a result of his/her parents giving praise and attention when he/she

plays. A **negative reinforcer**, on the other hand, is something not **conducive** to the organism in the process of learning, such as, an aversive high pitched tone, an electric shock, extreme cold or heat, social loneliness, etc. **Negative reinforcement** is, therefore, removal of an already operating aversive stimulus. **Punishment** refers to the removal of something positive from the situation or adding something negative to the situation. In a laymen's terminology, it can be said that punishment is either taking away something the child wants or giving it something he/she does not want. **Extinction** refers to the removal of a reinforcer that is helpful in increasing or sustaining a behaviour. This is generally used to remove undesirable behaviour from the behavioural repertoire of a child. It is based on the principle 'pay no attention' to undesirable behaviours.

Don't label as good or bad regarding the undesirable behaviour of the children immediately but at the same time give appropriate reinforcement for the desirable behaviour instantly.

Another important consideration in the administration of reinforcement is whether all the responses of the child should be reinforced. Generally, in the beginning of a learning situation, all the responses of the child are reinforced, continuous reinforcement, this however may be difficult and can also result in the desired behaviour disappearing once the reinforcement is stopped. The other pattern of reinforcement that can be used is partial reinforcement which is more effective in maintaining desired bahaviour. To reinforce continuously or partially is an individual choice and not necessarily a part of the same process. Also, partial reinforcement is more effective than continuous reinforcement. Partial schedule of reinforcement is more effective than continuous reinforcement. Partial schedule of reinforcement can be of two types: **ratio** and **interval**. The basic difference between ratio and interval schedules is that of frequency and timing. In case of ratio schedules, the emphasis is on the number of activities a child does, e.g., solving five addition problems, learning a poem, etc. Interval schedule is based upon the duration, e.g., you give the reinforcement after the child has studied for ten minute, does a particular work for a certain period of time irrespective of the amount of work done by the child during the period. Researches have indicated that ratio schedules are more effective than interval schedules of reinforcement.

There are three important conditions for operant conditioning to take place and effectiveness of operant conditioning depends on:

1. **Magnitude** → greater the reward greater effect.

2. **Contiguity**, i.e., reinforcer must follow response.

3. **Schedules of consequence**, i.e., interval/ratio.

Related to it is an important concept of **shaping**. Parents and teachers, as suggested by Skinner, can shape, inculcate any behaviour among children with the appropriate use of reinforcement. This method is also known as method of successive approximations. To shape a particular behaviour, you begin by reinforcing the first response that in any way approximates the desired behaviour and continue or reinforcing that response until the organism emits it fairly frequently. At the point you reinforce, only those responses that more closely resemble the desired behaviour, then those that resemble it more closely still, until eventually only the desired behaviour itself is being reinforced. For example, you want to inculcate hand-raising behaviour among the child in response to the question asked by the teacher. First of all, when the teacher asks a question, any movement of the body is reinforced. When it is established, any movement of the hand is reinforced, then movement of the right hand, thereafter lifting of the hand and finally raising the hand.

Check Your Progress

Note : a) Write Your answers in the space given below.
b) Compare your answers with those given at the end of the block.

2. Define learning according to Behaviourists approach.

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3. List major differences between classical and operant conditioning.

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4. Differentiate generalization from that of discrimination.

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5. List any three ways of modifying behaviour in children.

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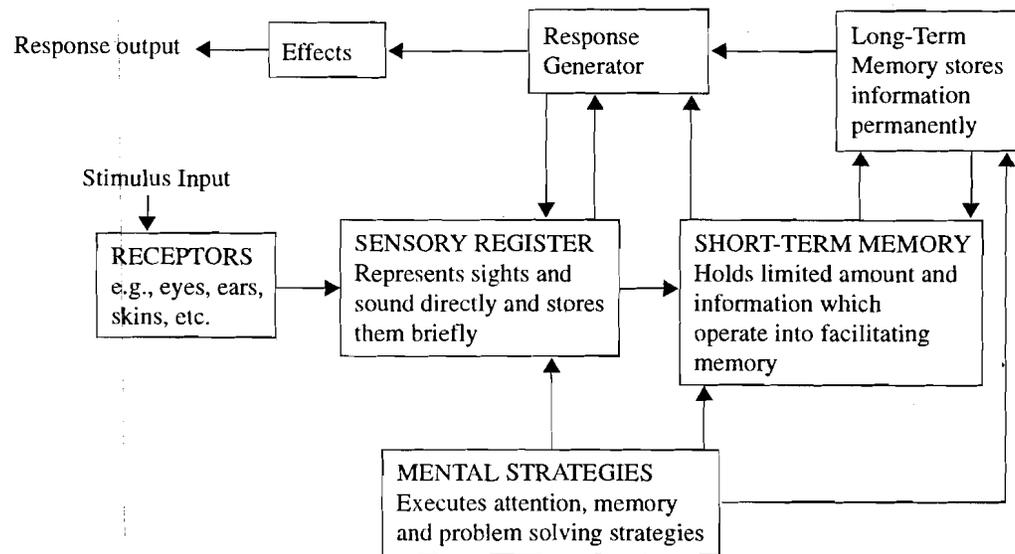...

2.5.2 Cognitive View of Learning

We have discussed earlier the major differences between behaviouristic and cognitive views of learning. While behaviourists give more emphasis on environmental conditions and over behaviours in learning, cognitive psychologists look more at how individuals process the stimuli they encounter — that is, how individuals perceive, interpret and mentally store the information they receive from the environment. Thus, the focus of cognitive theorists is the individual's active effort and input that is a more important factor in learning as compared to the environment stimuli, which however are also important.

One major thinker in cognitive psychology has been Jean Piaget who proposed learning to be the result of exploration and insight of the individual. Another theorist, Vygotsky, however, viewed learning as a product of interaction between the child and the other, in the process of problem solving.

A more recent development has been the information processing perspective which views the human mind and its learning process to be operating like a computer. This can be better understood with the help of following diagram:

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Response output ◄── Effects ◄──────── Response          Long-Term
                                       Generator  ◄───── Memory stores
                                                          information
                                                          permanently

Stimulus Input
      │
      ▼
   RECEPTORS         SENSORY REGISTER          SHORT-TERM MEMORY
   e.g., eyes, ears, Represents sights and     Holds limited amount and
   skins, etc.  ──►  sound directly and stores information which
                     them briefly         ──► operate into facilitating
                                               memory

                          MENTAL STRATEGIES
                          Executes attention, memory
                          and problem solving strategies
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From the environment, the learner receives stimulation which activates his/her receptors and is transformed to neural information. When the teacher writes on the blackboard (stimuli in the environment), it is received by the **sensory receptors** (eye) and the message is sent to the brain through nerve cells. Initially, this information enters a structure (or structures) called the **sensory register,** where it persists for a very brief interval. It has been found that attention of human beings is very selective, that is, we do not attend (register) all the informations impinging upon our sensory receptors, rather we attend to those information which are satisfying our needs. It is estimated that only $1/70^{th}$ information enters into short-term memory. Other information die out.

The information in the short-term memory persist for a limited period, generally thought to be up to twenty seconds. The capacity of short-term memory is also limited. You can retain only few items at a time in this storage. An interesting property of short-term memory is its ability to carry out silent, mental repetition of the information, a process called **rehersal**. Rehersal extends the capacity of the short-term memory to store items for longer intervals.

From the standpoint of learning, the most critical transformation occurs when it leaves short-term memory and enters the long-term memory. This process is called **encoding.** At this juncture, the individual tries to relate the new information to his/her already existing knowledge reservoir. A clerk after receiving a letter tries to put it in the relevant file. Whenever the teacher explains few addition problems in the class, the child attempts to relate it to his/ her already existing knowledge about number.

Note: Decay and intelligence account for major losses of information from short term memory (STM). In long term memory (LTM), the items and importance and rehearsal affect the retention and recall.

The encoded information is stored in the memory for a considerable time period. What is stored in memory may become inaccessible due to various reasons, for example, the information may decay due to time, interference between newer and older memories, etc. For example, a child learns mathematics and then learns English. The new information would interfere on the previous information, if the memory traces of the earlier information have not been consolidated properly. Further, the item's importance and rehearsal also affect the retention and recall. In order to be

verified as learned, entities must be retrieved from long-term memory. This involves recall of what has been learned (decoding).

The next transformation along the route of information flow is accomplished response generator, which determines the basic form of human responding, such as, verbal, muscular, or whatever. The last stage is the performance of the child through effectors, in order to show whatever he/she has learned.

This is how information processing theorists view learning to take place. You can also see that all these operations take place in mind. That is why, they emphasize on mental processes.

Learning thus is a process which begins with the environment inputs which is worked upon by the brain and then used as deemed fit.

1.5.3 Observation Learning

Almost everyday, we see instances of people watching others and learning from them. Little boys often emulate hero figures like Superman and Chacha Chaudhary. Through watching and copying one-another, pre-adolescent girls often begin to behave in similar ways, such as dressing alike and wearing their hair in faddish style. Children imitate their parents by developing similar hobbies and interests, by expressing similar political and religious beliefs, and by eventually raising their own children using the same disciplinary techniques used on them. Many skills acquired at school, including reading and writing, are learned at least partly through watching and imitating what one's teachers and peers do.

The learning by observation and modelling is the focus of **Social Learning Theory.** The principles of social learning theory are as follows:

1. People can learn by observing the behaviours of others (modes) and the outcomes of those behaviours.

2. Learning and performance are distinct from each other. In other words, the child may know how to solve the addition problem, but may not be able to do so for several reasons; such as, fear, the environment may not be conducive. etc.

3. Reinforcement plays an important role in learning.

4. Cognitive processes play a role in learning. More importantly, social learning theorists incorporate such cognitive processes as attention and retention (memory) into their explanations of how learning occurs. Four components are considered necessary for the modelling of behaviours that one observes. These are: attention, retention, motor reproduction and motivation.

Attention: For a behaviour to be modelled, an individual must first pay attention to the model, and especially to significant aspects of the modelled behaviour. For example, if a child wants to learn how to play cricket, he should watch how a successful batsman holds the bat, distance between the legs, and so on. Paying attention to the irrelevant parts of the model will, of course, not be helpful.

Retention: The second step in learning from a model is to remember the behaviour that has been observed. People store both verbal representations (such as step-by-step instructions) and visual images of the behaviours they have seen.

Motor Reproduction: The third component in modelling is to replicate the behaviour the model has demonstrated. When an individual lacks the ability to reproduce an observed behaviour, perhaps because of physical immaturity, lack of strength, or disability, this third step obviously cannot occur. Reproduction of an observed behaviour at the time it is observed is often helpful because it provides an opportunity for learners to receive feedback about how to improve their reproduction of that behaviour.

Motivation: The final component of modelling is to be motivated to exhibit the modelled behaviour. An individual must want to demonstrate what has been learnt. Although parents and teachers are often models for children, children do not model all the behaviour they observe their parents and teachers perform. Children model behaviours only when they are motivated to do so.

Check Your Progress

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

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

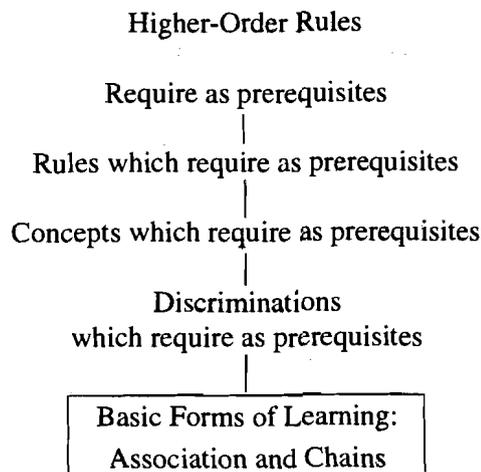6. Write any three characteristics for a behaviour to be modelled effectively.

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7. Here are some of the behaviours that can be learned through modelling. But the list is incomplete. Try to complete the given list:

a) Speech

b) Attitudes

c) Aggression

d)

e)

f)

g)

h)

i)

2.6 FORMS OF LEARNING

By now, you must be familiar with the different viewpoints about learning. In this section, we will try to incorporate the most important aspects of different viewpoints. Gagne has emphasized that, in order to learn a complex skill, one need to learn simple skills, and moreover, these skills should be interdependent. A summary of the interdependence of **intellectual** skills has been given below:

Higher-Order Rules

Require as prerequisites
|
Rules which require as prerequisites
|
Concepts which require as prerequisites
|
Discriminations
which require as prerequisites
|

| Basic Forms of Learning: |
| Association and Chains |

Based upon this interdependence, Gagne has identified eight forms of learning in a hierarchical order, as given below:

1. Signal learning

2. Stimulus-response learning

3. Chain learning

4. Verbal associate learning

5. Multiple discriminations

6. Concept learning

7. Learning of rules

8. Problem-solving

Here, we will try to understand salient characteristics of each form of learning.

Signal learning: This is similar to Pavlov's classical conditioning discussed earlier. A child visits the doctor and experiences fear reaction upon hearing that he/she needs to take an injection or undergo surgery. On earlier occasion, he/she has seen that taking injection is a painful process.

Stimulus-response learning: This is like the operant conditioning in which a particular stimulus becomes associated with a particular voluntary response. After seeing the teacher (stimulus) the child says 'Good Morning' (response) to the teacher. The teacher in turn smiles and says 'Good Morning' to the child (reinforcement).

Chain learning: Chaining is the connection of a set of individual S-R's in sequence, e.g., learning to put the alphabets in an order to make an appropriate word. Speaking is also a kind of chaining the words. Some sequences, such as, turning on a radio or cleaning the blackboard, are made up of motor responses. Other sequences are entirely verbal, for example, the greeting "How are you"?

Verbal associate learning: This is similar to chaining. The verbal associate learning occurs when two or more established verbal S-R links are put together. Human beings are capable of tremendous variety of performances with the use of their legs, hands, and arms but their vocationalisations shows an enormous versatility in social situations. A child is shown an object as a doll, the next time he/she sees the particular object, he/she will be able to say that it is a doll.

The act of naming a specific object like a doll seems likely to be a chain of at least two links. First, an observing response, S-R that connects the appearance of object with some responses, and at the same time serve to distinguish it from other objects of roughly the same type. The second links is the S-R connection that enables the individual to stimulate himself/herself to say doll.

$$S \underline{\hspace{2cm}} R \underline{\hspace{2cm}} s \underline{\hspace{2cm}} R$$

Object   Observing   doll   'doll'

The small 's' in the diagram stands for the internal representation of the object resulting from its observation.

Multiple discriminations: This means that an individual can make different and appropriate responses to different members of a particular collection of stimuli. For example, in a class when a child does not behave properly, you express your anger towards that child and not to all children. Given different types of furniture, you are able to differentiate a chair, a table, an almirah, etc. Similarly, a child recognises her mother in a group of women to is another example.

Concept learning: One way the individual can learn to respond to collections of things is by distinguishing among them (discrimination learning). Another way, even more important as a human capability, is by putting things into a class or group and responding to any instance of the class as a member of that class. This latter learning in a sense, seems just opposite of the first kind. But it is more than that, because it incorporates the first kind as one of its preconditions. This latter learning, which enable the individual to respond to things or event of a class in similar ways, results in the kind of learning outcome called a **concept**.

This can be understood with the help of an example. We are familiar with different varieties of fruits: bananas, oranges, grapes, mango, apple, etc. Depending upon some similarity among them — for examples, they are naturally produced, seasonal, can be eaten raw, need not be cooked, and so on, we have put them into a class "fruit". At the same time, we also make discrimination among different types of fruits as well as fruits from vegetables, furnitures, etc. Another example could be of "school children". All children going to the school may be put into a class/category and you discriminate them from children not visiting the schools.

Learning of rules: According to Gagne, a rule is an inferred capability that enables the individual to respond to a class of stimulus situations with a class of performances, such performances being predictable related to the stimuli by a specific class of relations. For example, an individual responds to a class of situations (4+5, 8+9, 5+3) that are predictably related to the stimuli by a relation that may be expressed as "independence of order". The rule that governs this behaviour may be represented by the statement "adding the class of numbers 'a' to the class of numbers 'b' is independent of the order in which 'a' and 'b' are combined."

Problems-solving: one of the most complex activities of human beings is problem solving. Rule learning is a precondition for problem-solving. In problem-solving the most important part of the process takes place within the learner. Problem-

solving may be viewed as a process by which the learner discovers a combination of previously learned rules which can be applied to achieve a solution for a novel situation. By the selective process of setting up and testing hypotheses using various strategies and different rules, problems are attempted and sometimes solved. We have discussed in detail the nature, theories and types of learning. At the end, now you may be able to develop a better picture of what is learning, the differences between the behaviouristic and cognitive views on learning and, more importantly, the different types of learning.

Check Your Progress

Notes: a) Write your answers in the space given below.
   b) Compare your answers with those given at the end of the block.

8. What is the basic difference between signal learning and stimulus-response learning?

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9. Give few examples of verbal association learning.

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2.7 LET US SUM UP

Learning is one of the most important and pervasive activities of human life. It begins from birth and covers our entire life span. In this Unit, we discussed in detail the nature of learning and how learning takes place according to the various opinions available. In this regard, two important schools of thought emerged, i.e. the behaviouristic and cognitive. We also discussed the different forms of learning.

2.8 UNIT-END EXERCISES

1. Prepare two lists of 16 words each. In the first list, keep four words from four concepts-furniture, fruit, vegetables and clothes-in a random order. The second list would contain unrelated items. Present both the lists before a child separately and ask the child to recall the word. Note down your observations.

2. Suppose a child is admitted to a Nursery Class. He cries all the time, does not sit in the class and always wants to go to his parents. What will you do to retain the child in the class?

3. Choose a topic which you want to teach the child. Prepare a flow chart showing the various mental processes involved in learning that activity.

4. Following are the two match stick problems. You may attempt to solve them and also note down the steps involved in solving these problems.

Problem 1:
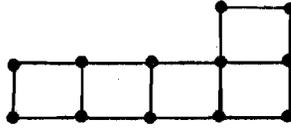
You can move 3 matchsticks to make 4 squares.

Problem 2:
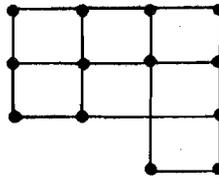
You can move 2 sticks to make 5 squares.

Now, since you have solved these problems, and noted down your reactions, it is important to point out the controversy between Behaviouristic and Cognitive views. The controversy is: whether you learn by *Trial-and Error* method or it is *insightful*. Behaviourists like Thorndike would emphasise that a cat, put in a box would need to work out how to get out of the confining situation and eat food kept outside the box. According to him, the cat will explore the box, by manipulating various parts of the box, and would eventually trigger the mechanism that opens the door. Once again, when the cat is put back in the box, it would try different behaviours until it triggers the release mechanism. In each succeeding trial, escape from the box would take less time as compared to the previous trials. The cat's approach to the problem situation appears to be one of trial and error, with the correct solution being followed by a positive consequence (escape from the box). A trial-and-error approach is often observed in the problem-solving behaviour of children.

Cognitive psychologists would rather not agree to Thorndike's proposition. According to them, in a problem situation, the organism carefully examines the components of a problem situation, the organism carefully examines the components of a problem situation, and mentally combines and recombines those components until he eventually finds a winning combination. At this point of insight he would immediately move into action, performing the required responses in a deliberate manner until the problem is solved.