
UNIT 18 INFORMATION PROCESSING AND HUMANISTIC APPROACHES TO LEARNING

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18.1 INTRODUCTION

The behaviourist thinkers tell us that most human behaviours can be programmed and shaped from outside. That is, human behaviour is contingent upon conditions or factors which can be externally controlled using Stimulus-Response conditioning. But the issue remains whether stimulus response and reinforcement can adequately explain the complete learning process. The cognitive thinkers would say, 'no', because they believe that a person's behaviour is always based on cognition, an act of knowing or thinking about the situation in which the behaviour occurs. The cognitivists are concerned with the organization of knowledge, information processing and decision making behaviour - aspects in the cognitive realm.

An important goal of cognitive instruction is to help students to process information in meaningful ways so that they can become independent learners. The type of questions cognitive psychologists ask include: what are the students thinking about during problem solving? What cognitive processes the students engage in? How can the effective learning strategies be taught?

Another goal of cognitive psychologists is to develop independent learners, or self-regulated learners. When given a learning objective the self-regulated students monitor and control their own behaviour by setting manageable goals, using their prior knowledge and considering alternative strategies etc.

This unit in addition to the information processing deals with the humanistic perspectives in education. The humanists hold the view that a child has an inherent desire to explore and to know. According to them learning can best occur when the children perceive it as more relevant to their needs and purposes and when it is self-initiated.

18.2 OBJECTIVES

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

- explain the information processing model of learning;
- identify how information processing system influences learning;
- explain the meaning and functions of the metacognitive knowledge;
- differentiate between declarative and procedural knowledge;
- elucidate the different strategies of learning vis-à-vis the declarative and procedural knowledge;
- use different learning strategies for strengthening the rote and meaningful learning;
- discuss various affective strategies;
- discuss the view of learning conceived by humanistic thinkers;
- clarify how change in perception is related to modification of cognitive and affective behaviour;
- elucidate learning principles as enunciated by Combs, Rogers and Maslow with classroom applications; and
- use humanistic principles to facilitate learning and development.

18.3 THE INFORMATION PROCESSING SYSTEM (IPS)

Let us think about the following questions: How does the human mind acquire information? What determines how much information is learned? How some information is remembered and other information soon forgotten? What can be done to improve the retention of information?

Cognitive psychologists have developed information process model to identify how humans obtain, transform, store, and apply information. In this section the focus will be on how the information-processing approach can be useful in improving classroom instruction and student learning. Figure 18.1 below shows a flow chart used to identify various components in the IPS.

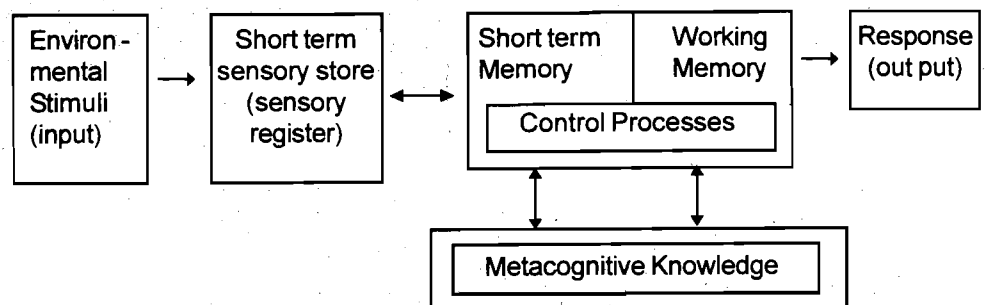


Fig. 18.1: Components in information processing system (IPS)

(Source: Dembo, 1991)

18.3.1 Short Term Sensory Store (STSS)

The sensory information from the environment such as visual perception of words in a text enters the short-term sensory store (STSS). It is stored there momentarily until attended to by the short-term memory. Information that does not enter short-term memory is quickly lost, usually in a fraction of a second. If the student does not attend to information, the question does not arise of it being retained or retrieved. So the most important aspect here is 'attention' which cannot be overestimated in any model of information processing.

18.3.2 Short Term Memory (STM)

In moving from STSS to STM the information is changed to a verbal form involving name coding. Shortly after seeing the letter A, for example, the student will no longer retain the visual pattern but will keep in short term memory the verbal name of the pattern, the letter A. Similarly "Tree house" will be held in memory as tree and house. STM is an active part of the memory system. Between the short-term memory and the long-term memory there exists a component called working memory, which is described as the centre of consciousness in the IPS. Whenever we are consciously thinking about something, or actively trying to remember a forgotten fact, or engaging in fantasy, we are using our working memory.

The information processing capacity of STM is limited in two ways. First, the STM of an adult can hold only 5 to 9 chunks of information at a time. This condition is referred to as the 7 ± 2 Magic Number. New information coming into STM will, if it catches the attention of the student, tend to crowd out the old information already there. For elementary children this capacity is even less. Second, without an active effort from the learner, STM holds information only for a brief time, often less than 30 seconds.

A number of control processes are found to operate at STM level. These processes focus on attention, manipulate information, and organize and assist in the retrieval of information. Some of these central processes operate automatically; others are subject to conscious voluntary control (Mayer 1988).

Now let us look at some of the control processes that are of particular interest to the classroom teacher. Since the STM is limited in the amount of information it can deal with at any given time, chunking or grouping of information is one way of keeping more than nine pieces (7 ± 2) of information in the working memory. For example, it is easy to remember a mobile number 9891285284 if it is grouped as 9891, 285, 284. The STM can handle more information when it is organized into larger units of information. Although STM uses various chunking strategies automatically and unconsciously, these strategies can also be taught to students.

Although the short-term memory retains information for a brief time, it is possible to retain it for longer time if it is rehearsed or repeated. For example, we often repeat the instructions, before they fade away.

18.3.3 Long Term Memory (LTM)

The LTM stores all the information we possess and are not immediately using it. Information enters the LTM through the working, or short-term memory. For retaining information into short-term memory, it must be rehearsed or repeated but to pass it on to LTM it must be "elaborated". The word elaboration here has a specific meaning. It means that the information must be classified, organised, connected, and stored with already existing information in LTM. In this process the working memory always calls up the relevant data stored up in the LTM. For example, when we want to learn about democracy, the working memory will call up our previously acquired knowledge about certain rights of the individuals, like freedom of expression, equality of opportunity, justice, or appropriateness etc.

Encoding is the process of transforming new information into memory for integration. Encoding for storage occurs in one of the two forms - the *episodic* and the *semantic memory*. Episodic memory is the recall of events in our lives. It allows us to recall images of what happened and what was said during the event. Semantic memory stores meaning. Andre and Phye (1986) stated that the semantic memory "contains the generalization we have drawn and acquired through experience" (p. 7). It contains our knowledge of concepts, rules, principles, and skills. When we read a whole book, it is the meaning or the essence of different aspects of the book that are saved, not every thing or anything that we read.

According to Anderson (1985) semantic memory further consists of two types of knowledge. First, *the knowledge about things* (called the declarative knowledge), such as a date, a friend's address, or information of any sort, and the second, *knowledge about how to do things* (called the procedural knowledge) such as solving a mathematical problem, driving a car, swimming in a pond or a running stream. The basic idea about these two types of knowledge was originally given by Gilbert Ryle, a well known positivist philosopher. He named these types as "know that" and "knowing how". The importance of distinguishing these two types of knowledge is that the conditions of learning of these types are different. These two types of knowledge are discussed in more detail later in this unit.

18.3.4 Executive Control: Development of Metacognition (MC)

The last part of IPS is the executive processes which monitor and direct the cognitive activities in progress. These skills are responsible for assessing a learning problem, determining the learning strategies to resolve or solve the problem, evaluating the effectiveness of chosen strategy and changing the strategies to improve learning effectiveness.

The functioning of the executive processes is based on meta cognition, which has two separate but related aspects: 1) Knowledge and belief about cognitive phenomena, and 2) the regulation and control of cognitive behaviour. According to Flavell (1976), meta cognition "refers to one's knowledge concerning one's own cognitive processes and products e.g. learning relevant properties of information or data. Among other things metacognition also refers to active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objectives on which they bear, usually in the service of some concrete goal or objective".

Knowledge and beliefs about cognitive phenomena are involved whenever we assess our ability to perform a task or solve a problem. For example, when we are faced with a new learning situation, an awareness of our learning strengths and weaknesses helps us to decide whether we are likely to succeed or fail in that situation. It is in other words to recognize or realize our own cognitive limitations in a particular situation. The second aspect of metacognition is the regulation and control of our cognitive behaviour which directs our thinking to plan an approach to the learning tasks, to monitor our progress, to check our understanding, and to evaluate our solution.

As part of being a good student, one learns to be aware of the state of one's mind and the degree of one's own understanding. The good student may be one who often says that he/she does not understand, simply because he/she keeps a constant check on his/her understanding. The poor student who does not watch himself/herself trying to understand, does not know whether he/she understands or not. A student who uses metacognitive abilities after reading a book, paraphrases each important section of the book, underlines important facts, and monitors his/her own progress during study and finally evaluates his/her understanding by writing answers to short essay questions.

Check Your Progress 1

Note: Write your answers in the space given below.

- 1) Differentiate between STSS and STM.

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- 2) Define the term 'metacognitive knowledge'.

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- 3) What is executive control and what does it deal with?

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18.4 LEARNING STRATEGIES

Weinstein and Mayer (1985) defined learning strategies as "behaviours and thoughts that a learner engages in during learning and that are intended to influence the learners encoding process, viz. the learner selects, acquires, organises or integrates new knowledge"

These authors have discussed the following types of learning strategies: rehearsal strategies, elaboration strategies, organizational strategies, comprehension monitoring strategies, and affective strategies: Good and Brophy (1990) summarized these types as follows.

Rehearsal Strategies: These involve actively repeating (saying, writing) material or focussing on keyparts of it. For brief rote learning tasks (i.e., arbitrary or unrelated factual information) rehearsal may involve nothing more than repeating the material aloud. For more complex tasks rehearsal may involve repeating key terms aloud, copying the material, taking verbatim notes, or underlining important parts.

Elaboration Strategies: These involve making connection between the new and the familiar. For meaningful learning tasks, elaboration strategies include paraphrasing, summarizing, creating analogies, taking notes that go beyond verbatim repetition, answering questions and describing how the new information relates to existing knowledge.

Organizational Strategies: These include imposing structures on the material by dividing it into parts and identifying the super ordinate - subordinate relationship. In simple rote learning tasks organizational strategies involve breaking of the lists into

chunks. For more complex meaningful learning material, such strategies involve outlining the text creating a hierarchy or networking of concepts, or creating diagrams showing their relationships.

Comprehension Monitoring Strategies: These involve remaining aware of what one is trying to accomplish, keeping track of the strategies one uses and the success achieved with them and adjusting behaviour accordingly. Comprehension monitoring strategies include self questioning to check understanding; taking appropriate action when one does not understand something etc.

Affective Strategies: These include establishing and maintaining motivation, focussing attention, maintaining concentration, managing performance anxiety, and managing the time effectively. From the cognitive perspective, one of the major goals of teaching is to help students to manage and control their own learning. Good learners have been known to have better meta cognitive skills, more effective strategies for selecting and attending to important information and ability to organize material in a more efficient manner than the poor learners (Gagne 1985).

18.5 CATEGORIZATION OF KNOWLEDGE

Anderson (1985) categorized knowledge into two distinct pigeonholes, declarative knowledge and procedural knowledge. These are discussed in the following sections.

18.5.1 Declarative Knowledge

The learning of declarative knowledge can either be meaningful or rote. Meaningful learning refers to learning concepts, procedures, or ideas from sources. The "meaning" in meaningful learning, comes from the learners' ability to relate new knowledge to old knowledge already in memory. Rote learning refers to mastering disconnected or arbitrary learning material. The learning tasks as lists of States and their capitals, the order of colour in the rainbow; or vocabulary are examples of rote learning.

Rote learning can be further categorized into three types:

- *Free Recall:* refers to recall of information, without any specific order or without association with other stimuli, remembering names of your classmates is a free recall task.
- *Serial Recall:* refers to remembering information in a particular order, such as names of the planets in order from the sun.
- *Paired Associate Learning:* involves recalling information that is associated with some stimuli, like the act of remembering the capital of each State or the meaning of English words in Hindi.

In the case of rote learning of whatever type, the teachers in general tell, that to memorize any list the only method is practice, practice, and practice. But the cognitive psychologists offer some advice as to how practice can be made more effective. Research has shown that *distributed practice* at frequent and short intervals is more effective than the *massed practice*. The massed practice method may be effective in learning a large amount of information in a short time, but it is poor method of learning if the retention of information is the goal. Think about the examinations on which you used massed practice. How much of the content did you remember a few days after the examinations?

In memorizing there is also a *serial position effect*. In general a person is more likely to remember information placed at the beginning (primary effect) or at the end (recency effect) of a list than information placed in the middle.

Most people find it difficult to learn a list at one time and find it easier to break the list into small parts. This is called part learning. This method is appropriate, for instance, in teaching the multiplication tables.

The relationship of new and old knowledge can influence the difficulty of learning and recalling data. Learning a task that has the same stimuli and responses, as a previously learned task will be easier than learning material with which you have no previous experience. This situation is called *positive transfer*. For example, a youngster, who has learned, how to keep a room tidy at home will find the same skill helpful in keeping the camp tidy. *Negative transfer* occurs when two tasks have the same stimuli but require a different response. Learning Italian after learning Spanish can be difficult because it is easy to confuse the Spanish and Italian words for the same concepts.

Forgetting : Forgetting is known to be an overwhelming impediment to learning. One of the explanations for this phenomenon is that interference from previous or subsequent learning does occur. When the interference is due to previous learning, it is called *proactive inhibition*. But when subsequent learning interferes, the phenomenon is called *retroactive inhibition*. Our ability to recall and use metric measurements, for example, can be hampered by our familiarity with English measurement system. This is proactive inhibition. An example of retroactive interference is the difficulty experienced by a student who finds that learning English in a second period interferes with learning German in the first period. Learning a second programming language on computer such as FORTRAN, may inhibit our ability to recall the commands and format of previously learned BASIC.

18.5.1.1 Using Learning Strategies for Improving Declarative Knowledge

a) *Rote Learning*

- i) **Rehearsal**: As indicated earlier information when repeated or rehearsed can be retained. Rehearsal is done by repeating the information to oneself subvocally or loudly. In the class the students often repeat to themselves the spellings of new vocabulary, multiplication tables, a poem etc.
- ii) **Elaboration**: One of the reasons that rote learning is often considered uninteresting is that it has a low level of meaningfulness. Few connections are made between the new information and old knowledge. One of the ways to facilitate rote learning is thus to increase the meaningfulness of the material by creating connections between the new data and the information student already knows.

To establish useful linkage between the new data and visual images or semantic knowledge we often make use of *mnemonics*. Use of mnemonics can be very useful in improving serial recall learning or in the learning of factual material such as names, categories, sequences, or groups of items. Mnemonics that are useful for serial recall employ the loci method, acronyms, peg word method, and key word method.

- **Loci Method**: In this method the student creates a mental image of a familiar place such as the classroom. In this image several easily identifiable locations are determined. The student then associates each individual item on the list with a particular location in the image. If you have to learn the state capitals of India, you can imagine different State capitals at different locations in the visual image of the classroom with a big map of India which covers the entire floor area of the room. Now you can imagine yourself walking through the room and reaching different state capitals and naming them. In this way the list of state capitals is made more meaningful through association with visual image.
- **Acronyms**: use the first letter in each word to form a mnemonic VIBGYOR, for example, gives the order of the colour of rainbow - violet, indigo, blue, green, yellow, orange, and red. Similarly there may be a sentence mnemonic that uses the first letter of each term as the first letter of each word in a sentence. My very efficient mother just sat up near pop - gives the names of planets in order from the sun: Mercury, Venus, Earth, Mars, Jupiter,

Saturn, Uranus, Neptune, Pluto. Another kind of acronym involves taking the first letter of series of words. Dad, mom, sister, brother can be used to help students remember the four steps in long division: divide, multiply, subtract and bring down or BODMAS: Bracket, Of, Division, Multiplication, Addition, and Subtraction.

- **The peg word method:** uses visual imagery and semantic association in remembering serial data. For instance, items in a list are associated as in visual image with each phrase in a chant: One is a bun, two is a shoe, three is a tree and so on.
 - **Key word method:** A useful mnemonic for learning foreign language vocabulary is the key word method (Atkinson, 1975) which involves creation of an image that relates the English to the foreign word. For example, the Spanish word for *postal letter* is *carta*. An appropriate image might involve a huge postal letter being transported to the post office in a shopping cart.
- iii) **Organization:** A method for increasing meaningfulness of rote memory is to provide an organizational structure. Hierarchical schemes of organization are especially effective. For example, students find it easier to recall the different types of rock when studying geology if an organizational structure is imposed. Learning of names of rocks can be difficult as demonstrated by this list: granite, gabbro, peridotite, syenite, felsite, basalt, pumice, obsidian, shale sandstone, conglomerate, limestone, dolomite, evaporite, organic limestone, coal, slate, schist, phyllite, gneiss, quartzite, marble, and anthracite. This list can be reorganised in a hierarchical fashion as shown in Fig. 18.2.

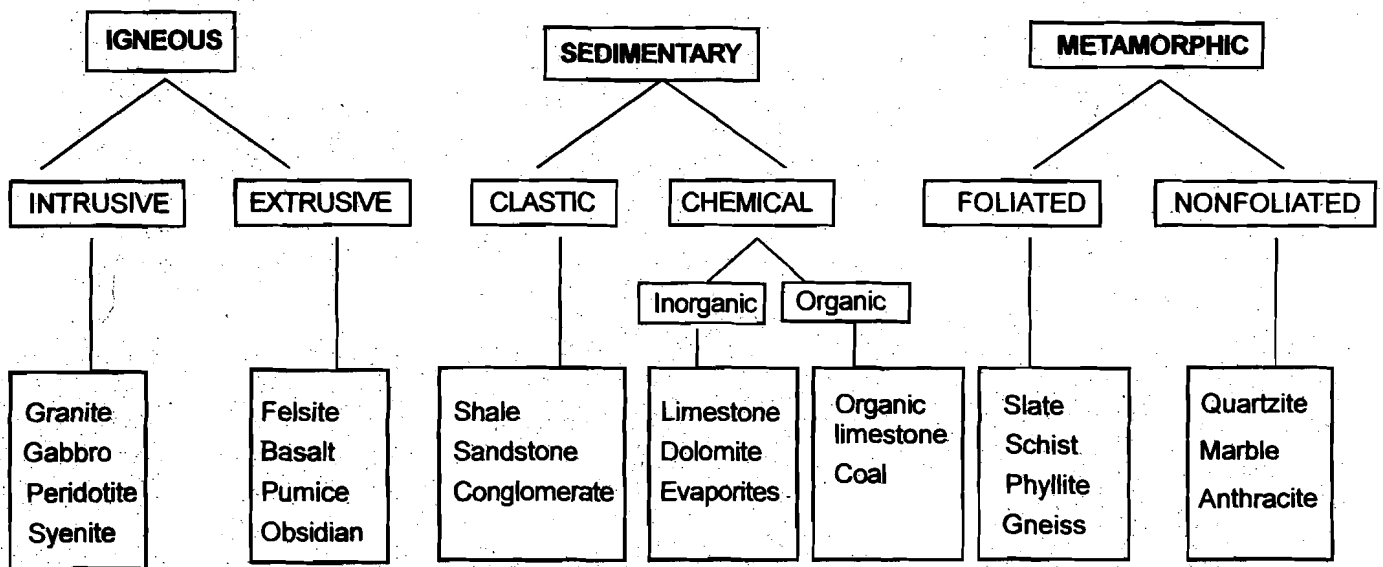


Fig. 18.2: Hierarchical Organization of Rock Types
(Source: Dembo, 1991, p. 281)

b) **Meaningful Learning**

For the most part teachers deal with meaningful knowledge. Such knowledge gets its meaningfulness from our ability to relate the ideas we have stored in our long term memory. When we gain information about something what we store is the meaning or main ideas contained in the text. There are four strategies which facilitate the storage of ideas in long term memory. *Rehearsal, elaboration, organization, and comprehension monitoring.*

- **Rehearsal:** A method of external storage and rehearsal of textual material is underlining. *Underlining* allows students to quickly locate and review important information in a text.

The student should however underline only the information that they find important, not irrelevant information.

- **Elaboration:** Elaboration means providing more information to what we have said to provide detail, to give examples, to make connections to other issues, or draw inferences from the data. The additional information makes our point more meaningful to the listener and also makes the point easier to remember.

Note taking: When information is presented faster than students can encode it, they will not be able to keep it up. In such a situation, student may choose a method of external storage such as note taking. However, we should take summary note, which encourage reorganization and integration. The notes should be brief and in student's own words that organize and summarize the important points. After taking notes we should necessarily review them. That will allow further elaboration and integration of the material. Simply taking notes and placing them aside for a long time will not be helpful. We should take conceptual notes and stress the main ideas.

- **Organization:** As in the case with rote learning, new meaningful information is easier to remember if it is presented in an organized format, especially if the format is hierarchically arranged. The organization allows the individual to manage data more efficiently in working memory and to quickly locate the needed information stored in long term memory. One method of improving organization of encoded data is to provide written *outlines*.
- **Comprehension monitoring:** A major cognitive function in reading and study is comprehension monitoring. The skilled reader has comprehension goal in mind, such as finding a particular fact or determining the main ideas of a text. The strategy adopted by such a reader will be to skim the text for the fact or read the text for the main ideas. Following the strategy, if the important fact has been located or the main idea grasped, the reader will experience satisfaction at reaching the goal. However, if he/she does not find the fact or the main idea or is not able to comprehend the passage, he/she may experience confusion. If the comprehension monitoring shows that the goal has not been reached, then the remedial steps would be taken such as rescheming the text or perhaps reading the text more carefully.

The following are some strategies for monitoring and improving comprehension of the text.

- **Change the rate of reading:** speed up your easier sections to quickly get the idea, but slow down for more difficult sections.
- **Suspect the judgement:** if something is not clear, continue to read, add more information, or clarify the points in the text.
- **Hypothesize:** when something being read is not clear make it a habit to hypothesize about meaning of the particular passage and read along to see that your guess makes sense.

Adjunct Questions: Questions added to text to influence what is learned from the material are called adjunct questions. These may also be referred to as Focus Questions. The use of adjunct questions has been found effective in a wide range of instructional settings. The placement of questions affects the material that is attended to.

One method of study has incorporated adjunct questions for several decades: *The SQ3R system* (Robinson, 1972). This system encourages the student to *survey* the chapter headings and bold face type, to develop *questions* about materials, then to *read, recite* and *review* the material.

Schemata: For comprehension monitoring and problem solving the use of schemata has been found very effective. The schemata (plural of schema) are cognitive structures

that may be created through the abstraction of previous experiences. Schemata make learning easier by providing meaning to the incoming information and reducing the number of things that can be attended to. They provide an organisational structure into which new information can be fitted. Second, they let us know what can be expected from the incoming information. This is the interpretive function of schemata, whereas the former is the organisational function. Hierarchical organisation of knowledge, as in the geology example indicated earlier, demonstrate the organisational function of schemata. In the case of interpretive function, for example, we know that a story will normally have at least one character, a conflict, a beginning, a climax, and resolution.

Advance Organisers: Another way in which schemata have demonstrated their usefulness in promoting comprehension is through the use of advance organisers (Ausubel, 1968). Advance organisers present information to make the lesson more meaningful and easier to understand. In this model we start presenting information from a higher abstraction and generality and help the learner to subsume or integrate new material.

Before students begin studying the caste system in India, for example, a brief presentation of social stratification as an organiser will help them to understand the nature and purpose of caste system. In mathematics teaching the use of number line before proceeding to the addition and subtraction of negative numbers is another example of the effective use of an organiser.

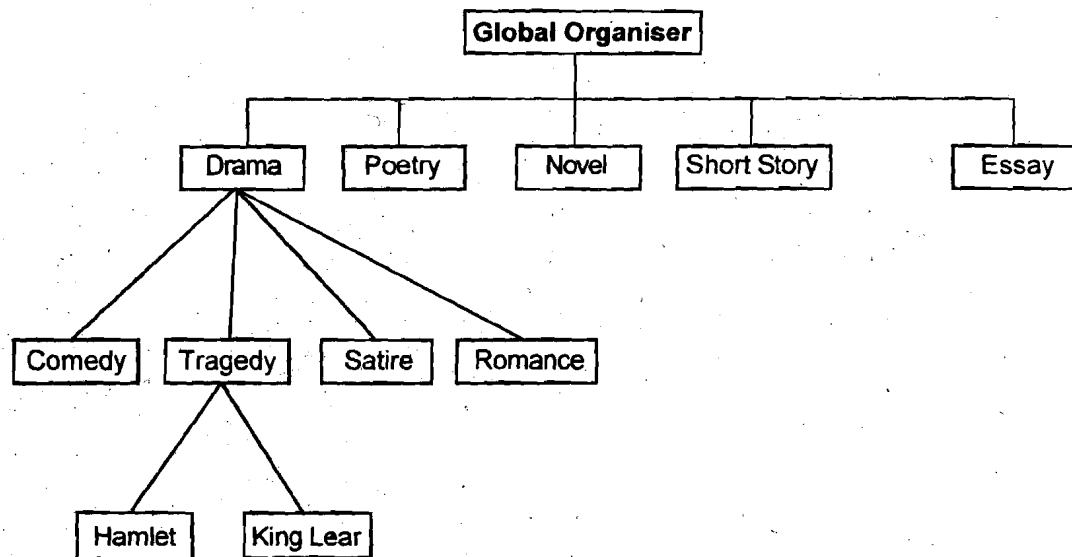


Fig. 18.3: General Organizer in Literature
(Source: Robinson, 1972)

- *Affective Strategies:* The importance of social and personal factors in learning is found related to motivational factors which are very important from the standpoint of cognitive psychologists and educators. Some learning strategies are designed to overcome certain personal factors that interfere with learning. For example, stressful conditions which interfere with learning can be reduced by relaxation training. Similarly attentiveness on academic tasks can considerably improve learning.

To start with let us discuss the attention problems of students which severely distract them from learning. There are some students who filter out appealing distractions and focus on the academic tasks, but there are others who fail to do so. Corno (1987) viewed attention concerns as a self management problem, because students have difficulty in planning and controlling their learning. She believes that students need to be taught to self manage or self regulate their behaviour by the use of learning strategies to handle distraction. Some such strategies are:

- Keep objective focal: Pay attention to what you are doing.
- Avoid visual contact with the distractor
- Isolate self: I will better go to the learning centre.
- Protest: Please I am trying to concentrate here.

18.5.2 Procedural Knowledge

So far we have discussed about declarative knowledge - "knowing that" type which is a major aspect of school learning. Now we shall discuss procedural knowledge. Procedural knowledge tells us how to do thing. It can be thought of as being composed of conditional "if", "then" statements which take the form, if certain conditions apply then a specific action is to be taken. An example of a arithmetic procedure occurs in dividing by fractions. If dividing by a fraction, then invert the divisor and multiply.

18.5.2.1 Using Learning Strategies to Improve Procedural Knowledge

Procedural knowledge takes one of the two forms: *pattern – recognition knowledge* or *action sequence knowledge*.

i) **Pattern – Recognition Knowledge:** This type of knowledge pertains to the ability to recognize and classify patterns of stimuli. One important instance of pattern recognition is the ability to identify new incidents of a concept, or concept learning. A concept represents a group of ideas or things that share some common characteristics and have the same name. Recognizing that platypus is a mammal, because it is a furred animal that suckles its young, is an incident of pattern recognition skill.

Concepts and other pattern -recognition procedures are learned through a process of generalization and discrimination (Gagne, 1985). Generalization is the process of broadening the range of situations in which a specific concept or pattern recognition procedure is found appropriate. The discrimination, on the other hand is the process of reducing the range of situations to which the concept applies, based on some defining characteristics of the concept.

In teaching children various concepts and pattern recognition procedures, the teacher first defines a concept and then gives examples to illustrate accurate application of the procedure. By accurate it is meant that the children will be able to apply the concept or procedure in different but appropriate situations and refrain from applying the concept in an inappropriate situation. The teacher strives for accurate generalization and discrimination. Two conditions promote accurate generalization: i) presentation of true example of concept that are similar on 'defining attributes' but different on 'irrelevant attributes'. The example of mammals meet these two conditions because the attributes of furriness and suckling of the young remain constant. ii) successive presentation of examples is made so that they may be held in working memory simultaneously. Thus while teaching mammals, we should present examples not only of platypus but also horses, dogs, humans, mice and other mammals.

Accurate discrimination is stimulated when there is simultaneous presentation of examples and matched with non-examples. The matched non examples share relevant and irrelevant attributes but vary on at least one relevant attribute.

To give an example, suppose you want to teach students the concept of living and non-living objects, first you will teach them all the attributes that living objects must possess, like movement, growth, response, giving birth to similar species, respiration, excretion and so on. Generalization will be promoted through the use of varied examples of living organisms such as protozoa, fish, mammals, and plants. You will make it clear

how these organisms carry out the above said life processes. To promote discrimination you will provide matched non examples such as crystals that grow but do not carry out other processes such as movements, respiration etc.

For promoting generalization and discrimination another example can be taken from mathematics. Suppose you want to teach the concept of finite sets, then after defining finite set as one in which the number can be counted, you will present some examples for promoting generalizations.

- [5, 10, 15]
- Even number of less than 100
- All apples in the world
- All grains of sand in the world

Some of these sets are no doubt very very large, but at least countable in theory. To promote discrimination you may present matched non examples:

- [5, 10, 15]
- [Odd numbers greater than 100]

ii) **Action Sequence Knowledge:** The second type of procedural knowledge refers to the knowledge of action sequence. Action sequences are first learned as list of steps comprising some procedure (Anderson, 1985). For example, the steps in a physical activity such as driving a car, may first be learned as a series of instructions. The learner consciously proceeds through each step, one at a time, until the procedure is complete. In starting a car the learner might begin by thinking, "First, if the car door is closed, then open the door, second if the car door is open, then sit in the driver seat; if in the driver seat then put on the seat belt; fourth if the seat belt is on then insert the key into the ignition, with practice, however, the procedures become almost automatic. When procedures have been learned to the point of automaticity, another source of error is introduced - the set effect. The set effect results when the carrying out of an automatic action sequence leads to a failure in processing important information which results in inefficient or incorrect performance. For example, when driving home from work, how many times you have forgotten to stop at a store to pick up something? Once the action sequence for driving home from work has been triggered, it can be difficult to interrupt.

There are two major roadblocks to learning a procedure. First is the limited capacity of the working memory. Which is 7 ± 2 as discussed earlier. Any procedure that requires more than nine steps usually is too long to keep in working memory. To overcome this limit, one can be provided with a written list of steps.

A second potential problem in learning a procedure is the absence of prerequisite knowledge. For example, it is difficult for a student to solve a geometric problem if the necessary axioms and theories have not been mastered. The use of *task analysis* is helpful here. Through task analysis the necessary subordinate skills are identified. The teacher can then assess the student's abilities on the subordinate skills. And if necessary he/she can provide remedial lessons on the skills in which students are deficient before teaching the skill.

18.6 THE HUMANISTIC PERSPECTIVE IN LEARNING

The learning theories discussed so far have emphasized the role of environmental and cognitive factors in teaching-learning process. It is true that learning is affected by how students think and act, but it is also seen that students' learning is influenced by

the personal *feelings* and *meanings* they attach to their learning experiences, that is, how people perceive the environment. During the late 1940s, a new psychological perspective emerged because of the work of clinical psychologists, social workers, and counsellors. This movement became known as humanistic, existential, perceptual, or phenomenological psychology. They started to understand a person's behaviour from the point of view of the behaviour as such rather than the observer.

In this section we shall try to see how the humanistic psychology has influenced educational thought and practice. According to humanistic psychology "the behaviour of individuals is determined by how they perceive themselves and the world around them; and second, individuals are not solely the product of their environment, as the behaviourists would have us believe, but are internally directed, or fulfill their unique potential as human beings" (Dembo, 1991). The role of school is not simply to make children smart, but to make them smart and good. From the humanistic perspective, teachers should be concerned with making education more responsive to the *affective needs* of students. Affective needs are the needs that are related to students' emotions, feelings, values, attitudes, predispositions, and morals.

Arthur Combs, Abraham Maslow, and Carl Rogers have contributed immensely to the development of humanistic perspective in learning. They aimed at the development of a genuine concern for learners and respect the worth of others.

18.6.1 Combs' Views on Learning

Perceptual psychologists view behaviour as:

"To understand human behaviour... it is necessary to understand behavior's perceptual world; how things seem from his point of view... It is not the external facts that are important in understanding behaviour, but the meaning of the fact to the behavior. To change another person's behaviour, it is necessary somehow to modify his beliefs or perceptions, when he sees thing differently, he will behave differently" (Combs, 1974, p.15).

To the teacher, a student's wanton destruction of school material is inexplicable. To the students who cannot achieve recognition, status, or prestige in the school, such behaviour (although improper) may be a purposeful act that may bring recognition from peers. That is why the perceptual psychologists hold that to change behaviour, one must change an individual's perceptions. When teachers complain that students are not motivated, the teachers really mean that students are not motivated to do what the teachers want them to do. Yet if teachers selected different activities, they might find totally different reactions on the part of students.

Now let us see how a student's internal perspective relates directly to the learning process. Humanists see two parts in learning: (i) the acquisition of new information, and (ii) the individual's personalization of this information. Teachers make the mistake of assuming that students would learn if the subject matter is properly organized and presented. But meaning is not inherent in the subject matter. It is the individual who instills subject matter with its meaning (Combs et al 1974). The dilemma in teaching is not how to present the subject matter but how to help students derive personal meanings from the subject matter; if they can relate it in some way to their lives, you would have succeeded.

Combs (1981) delineates the major goals of humanistic education as follows:

- Accepting the learner's needs and purposes and creating educational experiences for the development of learner's unique potential.
- Facilitating learner's self-actualization and feelings of personal adequacy.
- Fostering the acquisition of basic skills and competencies (e.g., academic, personal, interpersonal, communicative, and economic).

- Recognizing the importance of human feelings, values, and perceptions in the educational process.
- Developing learning climate that is challenging, understanding, supportive, exciting and free from threat.

18.6.2 Maslow's Views on Learning

Abraham Maslow has been long recognized as one of the leading proponents of humanistic psychology. His work started with the study of human needs and their gratification, which influenced the understanding of human motivation. His theory is primarily based on the assumption that there are two kinds of forces existent in man - one that promotes growth and the other that resists growth. Maslow (1968) states:

One set [of forces] clings to safety and defensiveness tending to repress backward, hanging on to the past, afraid to grow ... afraid to take chances, afraid to jeopardize what he already has, afraid of independence, freedom and separateness. The other set of forces impels him forward towards wholeness of self and uniqueness of self, towards full functioning of all his capacities, towards confidence in the face of the external world at the same time that he can accept his deepest, real, unconscious self (pp. 45-46).

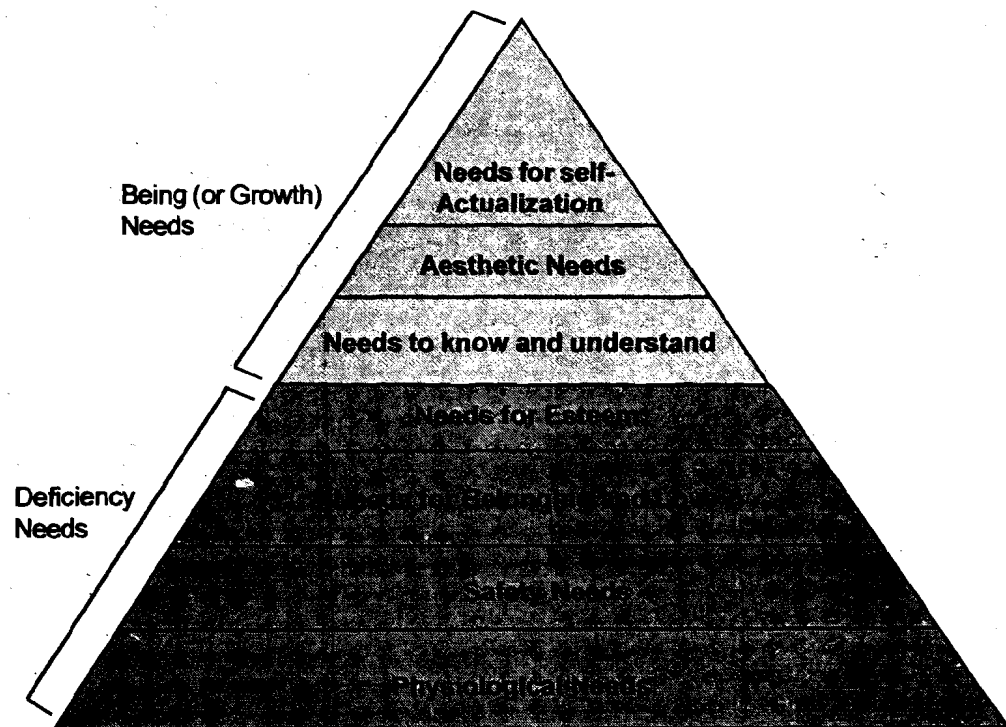


Fig. 18.4: Maslow's Need Hierarchy

(Source: Maslow, 1971)

Maslow believed that some human needs, like physiological needs are basic to other needs and that certain needs must be satisfied before the individual becomes concerned with higher needs.

Physiological needs (food, water, sleep etc.) are most basic and hence demand immediate satisfaction. Once these needs are satisfied, needs at the next level emerge (the safety needs) - the need for good health and for security from harm and danger. In this way the hierarchy goes on.

Maslow assumed that if the lower needs are satisfied, the motivation is directed towards self actualization —the need to develop the self potential, to become what one is

capable of becoming. Self-actualization is "not so much a matter of what a person does, as how much he feels about what he is doing".

Maslow distinguished the first four needs in the hierarchy from the latter ones. He identified the former as *deficiency needs* and the latter as *growth needs*. Generally, the gratification of deficiency needs depends on other people, whereas gratification of growth needs depends more on one's own self.

18.6.2.1 Instructional Implications of Maslow's Views

Maslow's hierarchy of human needs has important implications that teachers should take into account while working with children. A teacher may have difficulty in understanding why certain children do not do homework, are restless in the class or are completely uninterested in class activities. The teacher assumes that the desire to learn is an important need for all children, but Maslow suggested that interest or motivation to learn may not develop until other basic needs have been met. Children who come to school without breakfast or sufficient sleep, or with personal/family problems, anxieties or fears, are not interested in becoming self actualized individuals.

18.6.3 Rogers' Views on Learning

Carl Rogers, a humanistic psychologist, has influenced educational thought and practice to a great extent. He advocated an educational approach that tries to make learning and teaching more humanistic and thus more personal and meaningful. He has given certain important humanistic learning principles, which are central to his educational philosophy. These principles are briefly discussed here.

- **Desire to learn:** One of the foremost beliefs of Rogers is that humans have a natural desire to learn. You must have watched children's curiosity and eagerness to explore their environment, to ask questions, and to seek solutions. This inherent eagerness to learn is a basic assumption in humanistic education. In a humanistic classroom, therefore, children should be given freedom to satisfy their curiosity to pursue their interests, and to discover for themselves what is important and meaningful about the world around them. Rogerians have therefore advocated a child-centred approach to education.
- **Learning should be meaningful to students:** The second principle that Rogers emphasized is that significant or meaningful learning occurs when students perceive it as relevant to their own needs and purposes. Students learn best and most rapidly when they perceive learning as personally significant. Think of a student who quickly learns to operate a computer in order to enjoy a favourite game. Learning, according to humanistic psychologists, is purposeful and certainly motivated by the need to know.
- **Learning without Threat:** The third principle propounded by Rogers is that learning is best acquired and retained in an environment free from threat. The process of learning is enhanced when students can test their abilities; try new experiences, or even make mistakes without the sting of criticism or ridicule.
- **Self-Initiated Learning:** For Rogers and other humanists, learning is most significant and lasting when it is self-initiated and when it involves both the feelings and the mind of the learner. If the child is allowed self-direction, the learning becomes highly motivating and gives the student an opportunity to learn how to learn. When students learn on their own, they have an opportunity to make judgements, choices and evaluations.

In addition to being self-initiated, learning should involve aspects of the person - cognitive as well as affective. The humanists call this type of learning (i.e. learning from the 'gut', rather than just from the neck up) as whole person learning. Such a student will feel more personally involved in learning, more eager, more excited over accomplishments, and more motivated to continue learning.

18.6.3.1 Instructional Implications of Rogers' Views

Learning principles and teacher characteristics that Rogers has identified as central to his education philosophy, have been incorporated into his person-centered approach.

Rogers, like other humanistic educators, is not over concerned with teaching methodology. The value of curriculum planning, the scholarly expertise of teachers, or the use of technology are not as important for the facilitation of learning as the responsiveness to students feelings or the quality of interaction between students and teachers. Nevertheless, Rogers (1983) feels that there are certain instructional strategies and methods that are found helpful in promoting humanistic learning.

18.7 LET US SUM UP

The IPS model is used to identify how individuals obtain, transform, store, and apply information. It comprises the short-term sensory store, the short-term memory, the working memory, and the long-term memory. The flow of information through the IPS is monitored by the control of the executive processes called the metacognitive knowledge. Metacognitive knowledge is the process by which individuals think about their thinking. It involves knowledge about one's cognitive processes and active monitoring and regulation of these processes. As one acquires the metacognitive skills, one becomes independent and a successful learner. Students can be taught metacognitive learning strategies to manage and control their own learning.

Knowledge has been described as of two kinds: declarative knowledge (knowing that) and procedural knowledge (knowing how). Declarative knowledge is knowledge about things and can be either rote or meaningful. One can learn declarative knowledge by using strategies like rehearsal, elaboration, organisation, and comprehensive monitoring. Mnemonics are elaboration techniques that help us remember rote material by connecting it to visual images or semantic knowledge. By connecting the material and meaning we make it easier to remember.

For managing information more efficiently in the working memory, one can take notes, review the material and integrate it to what is already learned. One can also outline the text in an organised manner. A well organized knowledge in the long-term memory makes one expert in the area. Comprehension monitoring enables a reader to know whether he/she has understood what is read. Adjunct questions are most effective in promoting comprehension monitoring when these are placed after the text to be read. These also promote transfer. Schemata are cognitive structures that help learners to organise and process information efficiently by providing an organisational structure into which new information can be fitted.

Advance organisers can be used either to activate students' present cognitive structures or to equip them with necessary cognitive structure they do not have. Affective strategies motivate students, focus their attention, and help to reduce anxiety. Self-verbalization can be used to help students monitor and control their attention.

Procedural knowledge is knowledge about how to do things. It is of two types: pattern-recognition knowledge, and action-sequence knowledge. Pattern recognition is learned through process of generalization and discrimination. Such knowledge is involved in concept learning. Problem solving strategies involve the interaction of declarative and procedural knowledge. Procedural knowledge is more difficult to transfer than the declarative knowledge.

Humanistic teachers value educational goals that help students to learn more about themselves and make independent decisions. They prefer learning situations that are student-centered and oriented towards discovery method. They are concerned with individuals' feelings and perceptions as clue to their actions. They identify two parts that are inherent in learning: the acquisition of new information and individuals

personalization of this information. Combs believed that the way individuals perceive their actions is the key to understanding their behaviour. Maslow saw a person's motivational tendency as moving towards self-actualization or self-fulfillment. Rogers believed that individuals have an inherent desire to learn and they are more likely to learn when they perceive that learning is relevant to their own needs and purposes, and when it is self-initiated.

18.8 UNIT END EXERCISES

- 1) Illustrate metacognition with appropriate examples. What are its uses?
- 2) Define different learning strategies.
- 3) What are the two kinds of knowledge? Give examples of each.
- 4) Briefly explain the different comprehension monitoring strategies.
- 5) What is an advance organiser? Illustrate with examples.
- 6) What learning strategies can be used to improve procedural knowledge (learning how)?
- 7) Diagrammatically represent the hierarchy of human needs (Maslow) and explain their relation with human learning.
- 8) Identify the main learning principles as enunciated by Rogers.

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