

LESSON 7

THINKING AND PROBLEM SOLVING

SUMMARY

The process of knowing or acquiring knowledge is called cognition. The process of acquiring knowledge is facilitated by cognitive processes such as attention, thinking, remembering, and reasoning. The cognitive processes are very much specific to human beings and are guided by concepts, facts, propositions, rules, and memories. All these cognitive activities are governed by thinking.

Nature of Thinking

Thinking is a **complex mental process** which involves manipulation of information. It continues in our sleep as well. The difference between what is thinking and what is not thinking, is just our awareness about the particular thinking process. It is a constructive process as it helps in forming a new representation of any object or event by transforming available information.

It involves a number of mental activities, such as inferring, abstracting, reasoning, imagining, judging, problem solving, and creative thinking. Such activities take place in our mind and can be inferred from our behaviors.

It is usually initiated by a problem and goes through a sequence of

steps such as judging, abstracting, inferring, reasoning, imagining, and remembering. These steps are often directed towards the solution of the problem.

It relies on a variety of mental structures such as concepts and reasoning.

Concepts: Concepts represent objects, activities, ideas, or living organisms. They are **mental structures** which allow us to **organize knowledge in systematic ways**. We cannot observe them directly, but we can infer them from behaviour.

Reasoning: It is a process that **involves inference**. It is used in **logical thinking and problem solving**. It is **goal directed**, and the conclusions or judgments are drawn from a set of facts. There are two types of reasoning:

Deductive reasoning

deducing or drawing conclusion from a set of initial assertions or premises

Inductive reasoning

starts from available evidence to generate a conclusion about the likelihood of something

Most cases of **scientific reasoning are inductive in nature**.

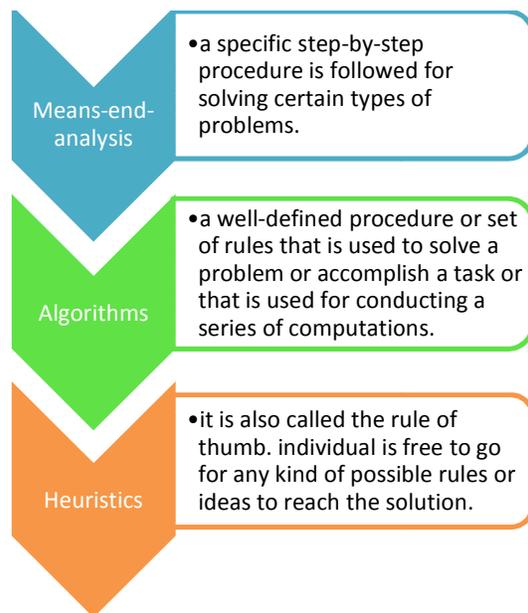
Problem Solving

In case of solving any type of problem our thinking becomes directed and focused and we try to

use all the resources, both internal (mind) and external (support and help of others) to arrive at the right and appropriate decision.

Problem solving is directed, thinking focused towards dealing with a specific problem. This thinking has three elements: **the problem, the goal**, and the **steps to reach the goal**.

There are two methods which are used prominently in problem solving - **“Means-end-analysis”** and **“Algorithms”**.



Problem Solving and Mental Set

Sometimes we use a particular strategy/technique to solve a problem but we may or may not succeed in our effort to solve the problem. This creates a set to approach future problems that are encountered by a person. The set continues even if the problem is different. Despite this, we use the same strategy/technique whenever we come across the same problem

and again fail to reach the solution. Such phenomenon in problem solving is called **mental set**.

Previous success with a particular rule produces a kind of mental rigidity/fixedness/set, which hinders the process of generating new ideas to solve a new problem. A mental set inhibits or affects the quality of our mental activities.

Creativity and its role in life

Creativity is a particular kind of thinking which involves reaching out to the solution of a problem in a unique and novel way which was nonexistent earlier.

Unlike routine solutions to the problems, creative solutions are novel, original, and unique. They are sudden or spontaneous and are the outcome of a lot of work and preparation already done consciously and unconsciously. The sudden appearance of new ideas is called **insight**.

Stages of Creative Thinking

Graham Wall as, one of the leading psychologists of the early twentieth century stated that there are five stages of creative thinking. These are as follows;

Preparation - the thinker formulates the problem and collects facts and materials necessary for the solution. Unable to solve the problem the thinker deliberately or involuntarily turns

away from the problem, initiating stage two i.e. incubation.

Incubation - This is a stage of no solution and involves a number of emotional and cognitive complexities. However, the negative effects of mental set, functional fixedness, and other ideas that interfere with the solution tend to fade. Perhaps, fatigue and too much of concern with the problem also mount up during this stage.

Illumination - In this stage a potential solution to the problem seems to be realized as if from nowhere. Illumination occurs with its “aha” experience when a sudden idea or solution appears into consciousness.

Evaluation - : In this stage the obtained solution is verified or tested to see if it works.

Revision - Revision is required in the case of a solution which is not satisfactory.

Research suggests that creative people are generally talented and have some specific abilities. They have some specific personality characteristics such as-independent in their judgments, self-assertive, dominant, and impulsive, prefer complexity, etc.

Decision Making

Decision making - it is a kind of problem solving in which we select an appropriate alternative out of a number of alternatives available to us. We make several decisions in

our day-to-day life, such as decisions pertaining to our personal life, social life, education, career etc. Decisions can lead to success or failure, but our decision making also involves judgment.

Judgment - Judgment is a process of forming opinions, arriving at conclusions, and making critical evaluations about objects, events and people on the basis of available information. The process of judgment is often automatic and spontaneous. It does not require any prompting. Some judgmental choices are habitual. Judgments involve evaluating information about the world (objects, events, persons, etc.), while decisions require making choices.

Do you know?

A personality dimension called ‘Origence’ has been shown related to creativity.

Evaluate yourself

1. Describe the role of ‘mental set’ in problem solving.
2. Discuss the stages of creative thinking.
3. Define the two types of reasoning with examples.