

# COGNITIVISM

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## INTRODUCTION

Cognitivism or cognitive approach to teaching-learning process provides both qualitative and quantitative description of child's perceptual, attentional, learning, memory and problem solving abilities during his developmental stages in a systematic way. From the cognitivism perspective development is viewed as improvements in these abilities through increasing amount of information presented to the child and more adequate operational strategies adopted by him gradually as he grows with age.

## EMERGENCE OF COGNITIVISM

Cognitivism as an approach came into existence as a reaction against the predominant role of behaviourism in education. Behaviourism or stimulus-response based learning theories viewed child merely as mechanistic and put excessive emphasis on learning conditions and material presented to the child, ignoring totally the innate predispositions, process or structures in intellectual development. S-R theorist were not concerned with differences in learners in term of age and abilities rather their goal was to discover the unifying principles of learning which would hold predominance across all ages. Standard laws of conditioning, reinforcement, generalization and extinction, etc. were invoked to explain the behaviour and standard of learning of the child. Children in such a teaching- learning environment have to be passive recipients (just like

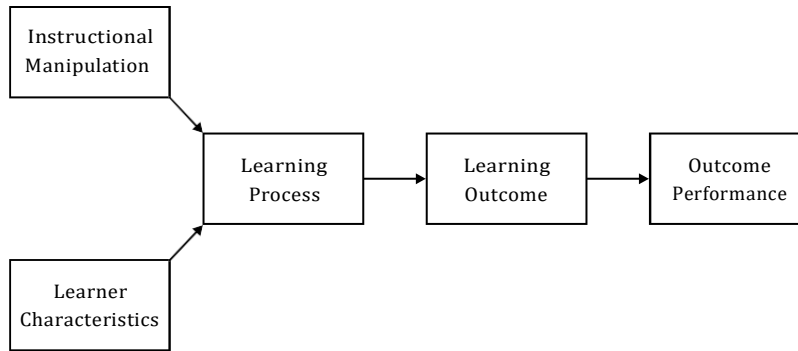
the organism in the classical conditioning experiments) to the information (stimulus) which they need to learn, repeat, retain and then to reproduce it when they are desired to retrieve it. Philosophy of behaviourism went on capturing the whole education system till 1950s across the world and no behaviouristic learning theory could recognize the importance of developmental aspect of children affecting teaching-learning process and its outcomes.

In 1950s, cognitivism, a theoretical framework for understanding the mind came into usage and become the dominant force in psychology in the late 20th century, replacing behaviourism as most popular paradigm for understanding mental function. Cognitivists asserts that people are not "programmed animals" that merely respond to environmental stimuli, people are rational beings that require active participation in order to learn, and whose actions are a consequence of thinking. Changes in behaviour are observed, but only as an indication of what is occurring in the learner's head. Cognitivism uses the metaphor of the mind as computer: information comes in, is being processed and leads to certain outcomes.



**Fig. 1: Computer Processing System**

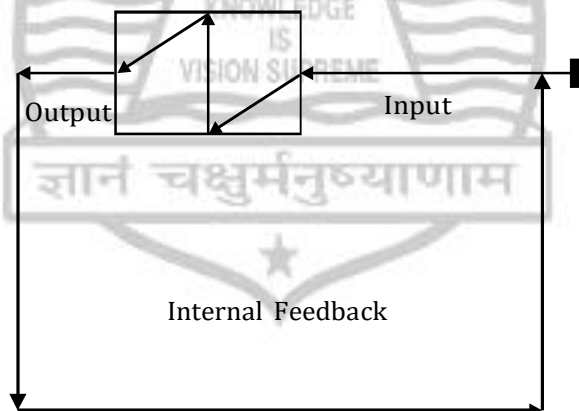
In a classroom, learning outcome depend upon instructional manipulation and learner characteristics.



**Fig. 2: Cognitive Approach**

## CONCEPT OF COGNITIVISM

The cognitivism is made from the word “cognition”. The term “cognition” which means to know. The term cognition is the scientific term for mental processes. The main theme of this new school is cognitive revolution (sometimes referred to as the ‘white-box’ theory) which postulates that internal process are the subject matter of psychology. This contrasts with behaviourism (sometimes called the ‘black-box theory’). By referring to behaviourism as the ‘black box theory’, it is implied that behaviourist are concerned with the output or response of the organism in a certain situations, and to some degree with the input or stimulus (S) but do not consider what transpires between the stimulus and the response. This unexplored element is represented by a ‘black box’ which intervenes between S and R. Cognitivism focuses on opening the ‘black box’ (human mind), which is necessary for understanding how people learn.



## Brain as a Problem Solving Device

### Definitions

According to *Wikipedia*, “Cognitive psychology is the study of mental processes such as attention, language use, memory, perception, problem solving, creativity and thinking.”

According to *Chegg Study*, “Cognitivism is the study in psychology that focuses on mental processes, including how people perceive, think, remember, learn, solve problems and direct their attention to one stimulus rather than another.”

According to *Peggy A. Ertmer and Timothy J. Newby*, “Cognitive theories stress the acquisition of knowledge and internal mental structures... [they] focus on the



Cognitivism is a very broad approach. It is the result of the contribution of many cognitive psychologists like Werner, Piaget and Bruner; Neo-Piagetian Robbie Case (1984, 1985); Robert Siegler (1990, 1991) and social-psychologist Lev Vygotsky. The classic work of Kohler on insight learning, Wertheimer's analysis of productive thinking and Duncker's experimental studies on problem solving— all paved a way for the emergence of cognitivism. The fundamental assumptions of this approach are:

- ❖ **Child is not mechanistic.** Contrary to the belief of behaviourists, child is an active, alert, intelligent and competent organism. He does not only receive information, he perceives and also processes it. He does not only respond to the stimuli but also gives them structure and meaning.
- ❖ **Perception and attentional abilities are fundamental for children's cognitive development.** From developmental perspective, cognitive abilities are inherently basic to the adequate development of child's different domains of personality.
- ❖ **Learning or thinking is not a blind drill.** It is the function of child's cognitive structures and processes to transform and integrate material into something meaningful that may be internalized.
- ❖ **In structuring child's cognitive abilities, his social world, biological factors, emotions, motivation and his experiences with the environment all play a role of significance.**
- ❖ **Child's mind is a dynamic and a developing reality. It gives meaning to the objects, things and settings. Meaningful 'whole' enhances the cognitive arena of the child. While comprehending and internalizing information, the gaps and inconsistencies are filled up.**
- ❖ **Any environment may have different psychological meaning to different individuals, which is equally important to understand for learning and determining child's behavior.**
- ❖ **Structural relationship between different materials or different parts of one material makes the material meaningful and in this way it becomes easier to be assimilated or internalized.**
- ❖ **Profiting from past experiences is an innate part of human nature,** which can be dynamically used in some specific situation to find the correct answer or to solve the problem. The experiential world of child has a place of significance in his life which should be properly recognized in teaching-learning setting.
- ❖ **Thinking is not merely a pure intellectual operation.** It is a process in which attitudes, feelings and emotions also play a significant role.
- ❖ **Development is directed by self-modification.** Through self-modification child uses the crest of his experiential world to the new situation or problem. Self-modification helps child to build newer and more useful responses to deal with forthcoming situations and problems.
- ❖ **This approach places high significance to learner- centred methods and techniques** in teaching-learning setup with more emphasis on problem-solving, project work, cooperative learning, and the situations where learner can use more insight and independent thinking in a productive way.

## **Cognitivism : In Relation to Learner,Teacher and Teaching-Learning Process**

Piaget, Bruner and other cognitive psychologists agree in rejecting mechanistic approach in learning. Cognitivism concentrates on giving opportunities to the child to discover knowledge in his own way with his own efforts under the planned guidance of teachers, elders and other experts. It seeks for the planning and organizing the teacher-learning process which suits the requirements of the learner. In this approach learner and teacher both have their distinct place of interacting with each other making teaching-learning process comfortably useful, as discussed below:

### **Role of Learner**

**Teaching-learning process is predominately learner-centered.** Learner occupies the pivotal position in learning situations. Cognitive psychologists find it hard to believe that there is merely a reward or praise or a candy between a child and his understanding of the problem. They

feel that when a child solves a problem he is motivated by his own basic competence, not by a mere stimulus-response reaction (*Bruner, 1971*).

- **Learner is active and participative.** He makes full use of his cognitive abilities. He can take initiative to plan and think through a problem. He can formulate some hypotheses, work on them, make interpretations and can draw conclusions.
- **Cognitivism views children as growing, developing, reflecting individuals** who accept information from their socio-cultural world through their own experiences. They understand, reflect, interrelate and interpret the concepts and all this enhances the boundaries of their cognitive world.
- **Learner's capabilities are accepted and recognized.** He is considered capable of steering his cognitive development and operates upon the environment by the use of more and more sophisticated cognitive structures and adopting appropriate strategies as he grows to solve problems and to reach the desired goals.
- **Strategies are conscious cognitive or behavioural activities** which are used to enhance mental activity. Children adopt and apply strategies at all level of learning, with the use of these strategies children can learn better, they can have optimal storage and retrieval of the information.
- **Learner has adequate freedom of expression in classroom democratic environment.** Both teacher and learner interact in the congenial atmosphere of the class; experiences are mutually exchanged; contents and activities to be carried out are discussed and final decisions for their execution are mutually decided.
- As emphasized by Piaget and Vygotsky **immediate environment of children provides them numerous opportunities for learning.** Children working upon their abilities profit from past experiences. Their experiential world, social and familial environment at home and school, expertise of teacher and other more able peers, etc. all help them to have 'deep' learning processes enabling them to grasp information easily and retain that for a long time.

- In cognitive approach **Learner is the master of the show**. It is evinced that as the child grows with age, he becomes more capable of using more sophisticated cognitive structures. Through the processes of assimilation and accommodation the basic cognitive structures are modified, from purely motoric interactions with child's physical environment they are transformed into symbolic thought processes, which begin to develop during the sensori-motor period and continue to develop until he attains the stage of formal operations. It means that cognitive abilities originate basically from within the child and can get optimum development in the appropriate environment. Therefore all educational planning and organization should keep this fact in view and adopt measures which facilitate child's development.
- It is believable that **younger children apply 'shallow' techniques of processing information**, whereas older children become quite capable of applying "deep" information processing techniques. Difficult tasks presented to young children can be met with failure because tasks themselves provide constraints upon children's performance. But if with expertise help the child finds out the way/answer suitable to the problem, his cognition about himself will improve and he may try again to find out some "mini-rule" to solve the problem in an appropriate manner. So, the cognitive psychologists believe, that the child will gradually be capable of learning new activities, and information through self-modification.

## Role of the Teacher

- **Teacher is a "Provider" or a Facilitator:** The cognitive approach in learning and teaching emphasizes that **the opportunities for self-learning should be provided to the learner** in exploring the field of knowledge, analyzing the world around in an insightful way and to broaden his mental abilities, therefore the role of **teacher is considered to be less dominating and less authoritarian and more of a "provider" or "facilitator"**. He is likely to create and maintain permissive, congenial and democratic atmosphere where children can get enough opportunities to test their hypotheses.
- **The Teacher Provides Needed Help:** All cognitive psychologists strongly believe that expertise plays an important role in problem solving. Even possessing innate mental abilities little children cannot always be capable of learning by themselves. Sometimes the nature of tasks may put constraints on children's performance. **The more experienced and mature expert (i.e. teacher) should be ready to provide all sorts of help** to the learner, facilitating his learning process.
- **To Help in Acquiring Proper Use of Language and Arts:** Vygotsky very strongly views that elementary mental functions – memory, attention and perception etc. – are endowed to the child by nature. These "natural" forms of mental functioning are transformed by the child's culture into higher mental functions like signs, concepts, symbols and even the writing system. These are the functions which help children in adopting new levels of psychological processing which is more adequate and beneficial in mental development. So, the teacher is expected to own this responsibility of helping children in learning and acquiring proper use of language and arts.
- **To Embed Material with Adequate Cultural Contexts:** Teacher is required to realize that

“culture has a profounding influence on how our thinking is organized” (*Vygotsky, 1934*). Children from different cultures use different approaches in reasoning and thinking about problems. It means that teacher should take care of the cultural consideration while presenting subject-matter to the children. “Cognitive tasks should be embedded in their appropriate cultural contexts, and serious underestimates of children’s development can occur if the culturally specific nature of children’s learning is ignored” (*Rogoff, 1990*).

- **To Help in Developing Learning Skills: Teacher should help children to develop learning skills.** Considering the concept of ‘zone of proximal development’ as conceived by Vygotsky, teacher should be aware of the ‘level of competence’ of the child, when the child works with him or with some other more able peers. In recent years, this concept led to use of ‘Scaffolding’ – an instructional process, in which the teacher adjusts the amount and type of support offered to the child suiting the child’s abilities, and withdrawing the support as the child

becomes more skilled.

- **To Help in Developing Language Skills: Teacher needs to help children in the development skills in language.** Though there is persistent controversy among cognitive theorists about the role of language skills in development of thought processes. Undoubtedly the language skills are of a great help in schooling. It is contended that that teacher should pay sufficient attention for developing language skills in children, especially the children from disadvantaged groups should be provided greater language experiences at school.
- **To Motivate Learners to Acquire Useful Knowledge: All cognitive theorists pay much importance to the concept of motivation.** They strongly emphasize that learning experiences to children, should be provided according to their level of mental development. They argue that certain subjects like mathematics and science should not be introduced before the stage of concrete operations of cognitive development. The teacher needs to keep his this responsibility in view in the actual classroom practice.
- **To Present himself as a Good Role-Model: Robbie Case (1984, 1985) proposes that children’s mental abilities develop appropriately** when they proceed through the set goals, to use abilities to solve problems, to explore the world around and to acquire knowledge through observation and imitation. Naturally, teacher’s role-model and expertise both are needed to help children to expand their cognitive world.
- **To Provide Expert Guidance:** Cognitive space concept has been assumed to be useful for adequate cognitive functioning. With application of insightful cognitive structures and deep processing mechanisms more space of functional memory can be transformed into long-term memory. It is obvious children need the expert guidance of teacher with this regard.
- In general, the teacher role is:
  - (i) To present some problems, especially to the beginners, and students should be encouraged to find out their solutions.
  - (ii) To encourage the students to explore their immediate environment, select some problem and work on it independently or with a group.
  - (iii) To encourage learners to take initiative, to do mutual discussion and have healthy interaction on issues of common interest.
  - (iv) To encourage and appreciate children’s critical and divergent responses, howsoever silly and

unconventional they may be.

- (v) To help learners when their ways to search out solutions to the problems are blocked, so that their motivation must not be waned.
- (vi) To participate and guide learners to re-examine the solutions of problems they have once sought out in order to make them more reliable and viable.

## **Teaching-Learning Process**

- **More Flexibility and Dynamism:** Cognitivism presumes and recommends **teaching-learning process relatively more flexible, constructive and dynamic**. No rigid laws of the doctrine are likely to prevail. The contents of subject-matter are not organized in a rigid way rather they are planned and organized according to the needs and potentials of the learners.
- **More Autonomy to the Learner:** As cognitive approach provides relatively **more autonomy to learners to explore the environment** and find out the ways and means to satisfy their curiosities, so the learners can be fully involved in the learning process. The problem of discipline does not arise in such a classroom environment.
- **Learning Situations are Open for Discussion and Dialogue: Teaching-learning situations are dynamic, quite open for healthy discussion between learners and the teacher.** Thus a democratic and healthy environment prevails in the classroom which allows positive interpersonal interaction between the learners and the teacher.
- **A Thoughtful Mode of Operation is Adopted:** Teaching material presented suits to the cognitive structures of the developmental stage of learners, appropriate means of operation are employed by them. Their ability of initiation is thus aroused. They get involved in the process of solving the problem or finding the requisite information to meet their curiosities, and getting success in their endeavour of search for knowledge and which is more satisfying for them than any other material reinforcement. Teaching-learning process in itself becomes a natural reinforcer for the students. We can say that a thoughtful mode of operation is adopted by those who follow cognitive approach in teaching.
- **Space for Independent Thinking is Available: Teaching-learning situation promotes independent thinking in learners,** which encourages students to expand their knowledge through independent learning. This approach of teaching satisfies learner's inquisitiveness, arouses curiosity and helps him in developing a scientific temperament, to make judgements and make decisions independently.
- **More Useful Methods and Techniques:** Methods and techniques employed here, prove to be more useful and effective in helping learners to transform the perceptual information into mental representations. The insight method, project method, heuristic method and inquiry-oriented analytical thinking method are considered more useful. Vygotsky's particular interest was to use psychological tools, in imparting instruction, such as language, counting mnemonic devices, algebraic symbols, art and writing which permit the child to function more effectively in solving problems and understanding his cognitive world.
- **Provision for Expert Support and Guidance:**



Recent studies conducted on children's learning have shown that children's ability for planning, problem solving and memory can be improved when they get guidance provided by more skilled partners. Vygotsky views that children 'Zone of proximal potential' can be enhanced providing them expert guidance, and under cognitivism perspectives it can be through co-operative learning and peer-tutoring.

- **Feasibility of Interactional Process:** Acquisition of knowledge cannot be a one-way traffic, neither the teacher nor the learners alone can expand their cognitive abilities. There should be interactional process between the two. Teaching-learning situations should permit students to construct their own strategies for the solution of problems, for example, a mathematical problem, can let them discover the "mini-rules" leading the process to automatization, and generalization.
- **Teaching-Learning Process is more Lively, Interesting and Useful:** Conveying contents of subject-matter cognitive approach in teaching demands that teaching-learning process should be lively. Teacher should make teaching interesting. He should focus on making connections between facts and fostering new understanding in students allowing them to choose their own way of finding information. Teacher needs to be an active partner in teaching-learning process, to carry out the necessary processes of thinking, analyzing and interpreting knowledge. Productive thinking, reflection, insight and creative aspects of learner's cognitive abilities are encouraged. Here, while teaching the holistic view of presenting the contents are preferred. While making assessments ability to analytic thinking, learner's initiation and involvement in learning, power of judgment and independence in decision-making, power of drawing conclusions and generalization, divergent thinking and ability to identify new problems in the proximal environment are given weightage. It is necessary that for evaluation purposes, instead of putting routine fixed-response questions, some questions assessing the way of elaboration of learners, open-ended questions, and multiple response questions must be given adequate space. In short, cognitivism calls for a dynamic, flexible, learner-oriented, democratic educational setup where learner plays the central role of constructing his cognitive structures and expanding his processes and making them more sophisticated and the teacher is to be the "facilitator", "a stage setter" to provide congenial environment and expertise help enabling students to further expand their cognitive abilities.

## CONCLUSION

Cognitivism is a major force in psychology. Though recent; yet it has its root in earlier period of psychology including the works of William James, Titchner and Gestalt psychology. It is interested in concepts such as consciousness, feeling, image and meaning.

This approach got impetus in recent years by several factors: e.g.;

- (i) Cognitive psychologists are studying the mental processes that intervene between stimulus inputs and response outputs and they believe that an understanding of these processes is necessary to provide a complete picture of behaviour.
- (ii) They have improved our methods of studying mental processes, their techniques are more scientific. Cognitive views have also been applied to the understanding of psychological disorders and to their treatment.
- (iii) One result of the influence of the cognitive approach is the study of varieties of consciousness

and recognition of the differences in levels of awareness.

The cognitive approach emphasizes the active internal nature of higher mental processes involved in such areas as attention, perception, memory, language imagery and reasoning. Today, it may be the most influential paradigm in psychology.

Many cognitive psychologists are interested in information processing – the ways our brains filter, select, process, store and retrieve information coming in from the environment. Some of them develop computer models of the brain. Their efforts are directed at identifying the ways in which the operation of the human brain is like the operation of a computer. In a way, a cognitive psychologist is like an engineer who tries to understand an automobile engine by studying the performance of the car.

