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Demystifying the Construct of Cognition: Understanding its implications for Children

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Abstract:

The word cognition when discussed tends to reflect on an ability or an abstract concept which is believed to be considered in the realm of studies in the fields of psychology, human development and studies in developmental and educational fields only. The educationists and psychologists find it a bit difficult to explain it in a way that it can be understood by one and all. The concept needs to be made available in the parlance of our everyday communications as well. In our day to day life we encounter a number of situations. While walking we acquire information about direction, while listening to someone we comprehend, process the information and also remember the details which can be retrieved later. Processing numerical information like addition, subtraction. These are some of the aspects of information processing; the subject matter of cognitive psychology.

Cognition essentially refers to an act of knowing and understanding, the analysis of this aspect and its components is the basic premise of the psychologists and educators. The dissemination of information regarding this all pervasive concept of cognition should reach the people not just the persons from the fields of education, cognitive psychology. Unknowingly all humans are performing many acts of cognition and re-cognition.

Key Words: cognition, information-processing, re-cognition

Introduction:

"Cognition is a troublesome term to define in psychology because it has no clear referent; it is defined narrowly by some as merely "awareness" (Guilford, 1967) and defined so broadly by others as to include all the higher mental processes(perception, thinking, attention, language, reasoning, problem solving, creativity and memory)" (Harre & Lamb, 1983) cited in((Sapra, 2005, p. 9). A cognitive approach inherently puts the onus of learning and information processing on the organism. The person just does not respond to the environment but also acts on it. This is the basic premise in any learning task which is to be mastered by the child. Neisser has defined cognition as "all processes by which sensory input is transformed, reduced, elaborated, stored, recovered and used (Neisser, 1967, p. 4)"cited in Sapra, 2005.

Superficially, there appears to be a vast diversity in the field of cognition. The guiding principle is that of finding 'internal rules' governing mental functions. The cognitive sciences are bound by the following four philosophical principles.

The behaviourists have tried to understand the behaviour in terms of interactions between the organism and its environment and tried to explore the relationship between the stimuli and the responses. The mind was treated as the 'black box'. Cognitivists tries to understand and explore the inner workings of the 'box'. **Methodological Individualism** tries to study individual minds' inner workings which is in independent of the individual's relation to others, to social practices and environment.

Commitment **to Methodological Structuralism** entails the understanding of structure. The cognitivists' perspective does not take into account the developmental or learning issues.

Intellectualism, the third commitment of cognitivists tries to understand the behaviour in terms of some level of cognition. The processing of information is the foundation for intellectualism is the reasoning and principle of logic.

The **Psychological Realism,** which implies that "mind is an arena of cognitive structures that are real and invariant across cultures" (Sapra, 2005 p2). Environmental, social, and contextual structures are needed in order to facilitate and discover nature of the psychological realities. The psychologically real structures of the mind are responsible for what a person does based on the rules that categorize them.

Historically, cognition has its roots in epistemological understanding of 'Tabula Rasa', the concept forwarded by John, Locke. (An Essay Concerning Human Understanding). The emphasis of John Locke on the first sense experience to be the source of all knowledge and secondly the reflections of one's awareness about thinking are considered as 'ideas 'by Locke. Watson's viewpoints on the active role of the environment in promoting behaviour as a consequence of positive or negative reinforcement. The S-R theories as an offshoot of behaviourist's theories focussed on conditioning, inhibition, avoidance learning. The experiments by Harlow on Rhesus monkeys focussed on the learning as a 'concept formation' process essentially is based on "process of broad generalization achieved by extensive training on a wide range of problems within one class s(concept formation derives from learning set formation)." (Harlow, Dodsworth, & Harlow, 1965)Cited in (Sapra, 2005, p. 14)

The concept of mind as an information processor has its genesis from computer engineering. The human mind performs the functions of information gathering, transforming, storing and retrieving or processes the information received and gives an appropriate output. The conceptual development focusses on mental processes like reception, classification, storage, and retrieval of information. The earlier information- processing models did not focus on the developmental perspective.

The Piaget's cognitive theories are the basic foundations for the cognitive theorists focussing on the information processing model of learning. The constructionist approach to concept development is the central theme of Piaget's cognitive theory in a developmental perspective. The learner plays an active role in his/her own construction of knowledge.

Vygotsky focussed on language and the role of inner speech as powerful tools of shaping thought. The role of the social interactions in a meaningful has been emphasized in his cognitive theory (Vygotsky L. , 1962; 1978)

Bruner, has propounded an interactionist and constructionism as the basic structures for conceptual development. The cognitive growth has been viewed as information –processing through internalization process. The information-processing has been proposed as 'enactive', 'iconic', and 'symbolic' representation based on the levels of cognitive growth. A focus on 'genetic pool' and the 'cultural pool' have been the areas researched by Bruner in his research studies. The studies have emphasized on the contribution of the cultural pool to be more significant than the 'genetic pool' for development of concepts (Bruner, 1962).

The term scaffolding was first introduced by Bruner to language acquisition. Bruner was inspired by the concept of ZPD, forwarded by Vygotsky that changing the level of support has the ability to sort the cognitive potential of children. The verbal support in the form of discourse has found acceptance in language acquisition.

Play has found support amongst researchers as an important medium for the development of higher mental processes and helps thinking to become more abstract, flexible and independent. The conversations between the teacher and the learner plays an important role in the development of concepts in children. (Luria & Vudovich, 1959 ;Ketch, 2005).

Essential features of scaffolding facilitates interaction between the learner and teacher. The collaboration if needs to be effective it should take place in the zone of proximal development of the learner and current level of understanding. The work needs to be done beyond that level to a certain extent (Bead, Hawkins, & Roller, 1991). The scaffolding and guidance needs to be removed gradually. It should be "Adjustable" and "Temporal" like the support provided to the building during construction (Palinscar, 1986). Scaffolding acts as a facilitator for internalization of knowledge, which is need for completing a task (Wood & Wood, 1996). Encouragement is an important component of scaffolding (Schetz & Stremmel, 1991).

Learning Process as a Function of Cognitive & Language Development

The crucial role of language in shaping understanding and its role in higher mental processes is a well-established fact supported by many research findings. The language and conceptual development converge so that it becomes difficult to segregate the two (Carroll, 1964; Arunachalam & Waxman, 2010; Sapra, 2011; Xu, 2012)). The language learning entails listening, comprehension, and oral language; both written and spoken. The language as an instrument for the development of cognition has to be explored in the realm of the language available at the child's disposal. The use of extended verbal instructions and interactions with parents have been found to act as catalysts in the conceptual development of children in

early stages of development. Language is essentially a part of cognitive domain. The language shapes the cognition and the interactions of children with the adults plays a significant role in development of concepts in children. In an educational setting the concepts are imparted to children in different contexts with different subjects. The concepts attained by children by virtue of their day to day interactions result in the development of spontaneous concepts. The scientific concepts on the other hand have verbal instructions and systematization at its core. This results in better verbal explanation by children about these non-spontaneous concepts as its beginning is with verbal explanations. Vygotsky, has stated that the concepts do not lie like peas in the mind, but are interconnected to each other. The concepts or understanding of various knowledge contents is the content matter of cognitive theories. The logical reasoning in children are to a large extent dependent on the development of non-spontaneous or the scientific concepts.

The concept of 'zone of proximal development' has important implications for the learning of new higher concepts under the able guidance of an adult or peer, which otherwise the child if left to himself/herself may not have attained. The focus on discovery methods, where, if the child does not receive any instruction may not have acquired the concepts. The language plays an important facilitative role.

The focus on 'concrete experiences' during early childhood years can be understood in the realm of Piaget's cognitive theory in a developmental perspective. Piaget on the contrary focusses on intrinsic motivation. "The high level functioning is a reward in itself and not an activity to please the teacher" p69. Thinking, has been accorded a higher platform by Piaget as a. 'self-regulating activity' beginning before the acquisition of language and goes beyond it. The high level thinking activities, are not tied to language like seriation, classification, matching activities to name a few (Furth, 1975) the implications of such a proposition is obvious; it is important to develop the mental and cognitive domains of the child. This enables the child to understand the verbal propositions.

How Experiences Shape Cognition

The nature and variety of the child's experiences have an important role to play in the development of concepts. Activities with active participation of adults expand the base of child's understanding and acquisition of concepts. The role of zone of proximal development focusses on the distance between a child's abilities at attaining concepts on his/her own in comparison to what a child is able to acquire under adult supervision. It plays a very critical and important role in acquiring concepts by children which are internalized. The intellectual scaffolding (Ausubel, 1970) (Bruner, 1962) can be described as the structuring of ideas and facts. The notion of scaffolding talk, used originally by Bruner in the context of cognitive development has great potential to even bring change in cognitive structures in children leading to higher cognitive structures. The scaffolding process tends to draw the attention of the child thus enabling the child to orient and directing the attention in accordance with the concepts to be learnt.

The learning is essentially a construction by the learner. The information needs to be tailored as per the stage of development of the child. We all have experienced a stage when we gain much more clarity of

the concept while explaining a concept to others. This new understanding with a different perspective and orientation is in fact re-cognition and reorientation and clarification of already acquired concepts.

The de- contextualization of ideas and concepts is the ultimate pinnacle of cognition. Decentring leads to an awareness of operations/actions themselves and a subsequent abstraction of their essential properties. "The new higher concepts in turn transform the meaning of the lower"; the case in point when we ourselves become clearer about our understanding of various phenomenon.

Discussion

The vastness of the field of study in cognition makes it very difficult to capture it in a pre-conceived framework. The multifaceted area of research has many diverse fields of study and research under its scope. The study of intelligence, attention and memory, conceptual development, linguistic abilities, learning, epistemological and philosophical aspects of the learning process are some of the study domains under the umbrella of cognition. The paper is an attempt to clarify the notion ofcognition and its implications for learning. The child's mental growth cannot be understood simply as a process of unfolding of the innate potential with the passage of time. Language, as a tool for learning has found acceptance. This has an important role to play not just in communication but for conceptual understanding and critical thinking as well. The concept of zone of proximal development can find its place in making qualitative changes in the child's thinking process in the form of appropriate and meaningful adult-child interactions. The facilitative role of verbal exchange between the teacher and the learner has been found to be of great help in enhancing conceptual flexibility in children.

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