CONSTRUCTIVISM

INTRODUCTION

Constructivism is a psychological theory of knowledge, which is called epistemology. It argues that humans generate knowledge and meaning from their experiences. Constructivism is an approach to learning developed by Seymour Papert and his colleagues at Massachusetts Institute of Technology who had worked with Piaget. It included everything associated with Piaget's constructivism, but went beyond it to assert that constructivist learning happens especially well when people are engaged in constructing a product, something external to themselves such as a sand castle, a machine, a computer program or a book. This approach is greatly facilitated by the ready availability of powerful 'constructing' applications os personal computers. Promoters of the use of computers in education see an increase need for students to develop skills in Multimedia literacy in order to use tools in constructivist learning.

The theory of social constructivism shows how it might be translated into a set of pedagogical approaches to the teaching of curriculum and to show how the pedagogy might be developed into practical strategies and activities for teachers to consider and deploy in their teaching.

CONCEPT

The concept of constructivism was given by Piaget in his theory of cognitive development. He designed a proper framework to understand the structure, functioning and development of the cognitive network of the human mind. According to him; children are active thinkers who are constantly trying to construct more accurate or advanced understanding of the world around them. In other words, from this perspective, children construct their knowledge of the world by interacting with it. How do children build such knowledge? What force keeps us moving through the various stages? First is the process of adaptation, which is the process of building mental representation of the world through direct interaction with it. The initial cognitive structure of a

child is supposed to incorporate only those cognitive abilities or potentials which help him to do some acts.

Piaget's work on the development of knowledge and understanding is founded upon the basic view that there is a set of processes which are unconsciously put into action each time an individual encounters information from any of their senses. To explain the processes, it is easiest to isolate occasions when sensory information is encountered and outline the possible mental processes that are initiated and followed through.

Piaget describes three essential processes which define the basis of the way in which, according to the theory of genetic epistemology, learning takes place. These are assimilation, accommodation and equilibration.

The first of these is assimilation, which involves the incorporation of new information or knowledge into existing knowledge structure known as schemas.

Schemas: All living, thinking beings have a set of rules which are variously known as "scripts", "schemas" that are used to interpret their everyday surroundings. Schemas are integrated networks of knowledge which are stored in long term memory and allow us to recall, understand and create expectations. This allows us to operate in a world that becomes increasingly familiar and understandable with the passage of time as the schemas are built up and increasingly interlinked.

A schema is a kind of "cognitive framework" for holding Constructivism framework to understand the structure, functioning and development of the cognitive network of the human mind. According to him; children are active thinkers who are constantly trying to construct more accurate or advanced understanding of the world around them. In other words, from this perspective, children construct their knowledge of the world by interacting with it. How do children build such knowledge? What force keeps us moving through the various stages? First is the process of adaptation, which is the process of building mental representation of the world through direct interaction with it. The initial cognitive structure of a child is supposed to incorporate only those cognitive abilities or potentials which help him to do some acts.

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A schema is a representational model of all of the knowledge that an individual has of any given topic Schemas are organized around themes or topics; the individual elements of a schema are linked by this common theme. Our schemas are very large and constantly growing and there are great many links both within and between our schemas. It is actually quite a difficult situation to understand.

When new information is processed, it is considered by the extent to which it fits into an existing schema. In many cases, it is possible that new information does not fit well into an existing schema. This is because the individual has little or no pre-existing knowledge which relates to or sheds light on the nature of meaning of the new incoming information. This is when we are puzzled or surprised by something which we experience we cannot easily relate it to something which we "know" already. In these cases, we have to either add the new information to an existing schema or alter a schema to allow for the new evidence which has been received. We have to assimilate or accommodate in order to maintain a state of equilibrium state within which we are not attempting to deal with contra- dictions.

The various schemas with their contents thus form the basic structure of the human mind. The earlier schemas represent those reflexes and instincts that are biologically inherited. However, as a child grows, with the interaction of physical and social environment, he is able to form different schemas, resulting in changes and modifications in his cognitive structure.

Assimilation: Assimilation is the collecting and classifying of new information. A schema consists of discrete items of knowledge which are linked to each other by the common theme of the schema. When a new information is encountered, this is added to the existing schema which is assimilated. How- ever, it will only be assimilated if it does not contradict some- thing already established as an integral part of what exists. If it seems that the new information is actually plausible, the schema is added to and the information is assimilated. This process is linked very closely to accommodation.

Accommodation: The second process is accommodation; which involves modifications in existing knowledge structure (schema) as a result of exposure to new information or experiences. i.e; changes in our existing knowledge structure resulting from exposure to new information. It is our tendency to alter existing concepts or mental frameworks in response to new information or new recognizable dimensions of the external world. Hence, accommodation is the alteration of a schema inorder for new and contradictory information to be allowed.

Piaget believed that it is the tension between these two processes that encourages cognitive development According to him, as these changes occur, children are constantly trying to make better and more accurate sense out of the complex world around them.

The structure of an organism is said to play a decisive role in its functioning. Therefore, what is available to an individual in terms of his schemas decides how he is going to respond to the stimuli present in his physical or social environment. On the other hand, the individual has to adapt to his environment for survival as well as proper growth and development. The key to his cognitive development thus lies in his constant interaction with an adaptation to his physical and social environment. The task of such adaptation is carried out through the processes of assimilation and accommodation.

Equilibration: This is the state of having no contradiction present in our mental representations of our environment. The linked processes of assimilation and accommodation are the means by which a state of equilibrium is sought. Equilibration is said to follow a threefold path.

(i) First, we are satisfied with our mode of thought and said to be in a state of equilibrium;

(ii) Second, if we become aware of a shortcoming or contradiction in our existing thinking, we become dissatisfied and enter a state of disequilibrium; we experience cognitive conflict.

(iii) Thirdly, we move to a more sophisticated mode of thought. We are able to eliminate the contradiction of the previous mode and in that way regain equilibrium, the cognitive conflict has been dealt with.

Hence, it can be said that assimilation is the process by which schemas are reorganized and developed. New information can be assimilated as long as it does not contradict the existing schema. Schemas are altered and restructured when new alternate or contradictory information arises - this is accommodation. Equilibrium is a state of balance for a schema when there are no conflicting elements. Equilibrium is the state which is innately sought by individuals.

Role of Learner

Constructivism is a modern approach in teaching and learning based upon the assumption of the generation d knowledge by the efforts of the individual learner. The role d the learner in this approach can be delineated as follows:

1. **Learner is the Creator of his Reality:** Constructivism upholds the conviction that learner creates his 'reality' through his own efforts by exploring and discovering the contents of his present environment. The "real world not as it seems to him, but rather it is what he as a learner perceives and discovers it. It is his psychological world which determines the meaning and context of the things, events and situations for the learner. Learner's "real world" from when he derives meaning and construct knowledge is created by him not by some other individuals. It is a separate issue, however that his perceived reality should essentially coincide with that of others to a greater extent, to get its social validation for the purpose of its being acceptable.

2. **Learner is a Unique Individual**: According to this approach, each learner is a unique individual, unparallel and Constructivism dynamic in his personality make-up and his background, needs, beliefs and experiential world. Each learner, thus, is complex and multidimensional. Constructivism not only acknowledges the uniqueness and complexity of learner's behaviour, but also it encourages, utilizes and rewards it as an integral part of the learning process.
3. **Social and Cultural Background of Learner** is considered as important as the learner himself. Learner's history of development and social symbol systems- such as language, concepts, signs, logic and even mathematical concepts which he has learned are a part of his socio-cultural background to which he belongs. This approach stresses the importance of learner's socio-cultural environment on which he acts upon to generate knowledge. Young children develop their cognitive abilities while interacting with their socio-cultural and physical world. Learner's experiences with his cultural world not only to help him to construct knowledge, but also to shape the knowledge and truth that the learner creates, discovers and and attains in the process of learning.
4. **Learner is the Creator of Knowledge**: Knowledge of does not flow from some expert persons down to the learner. Knowledge is a human creation. When it passes from some expert person to the other less mature, inexperienced individual it is considered as instruction or education. But in constructivism knowledge is constructed by the learner himself (though it is a very difficult and complex process). The learner interacts with his environment. He perceives, understands and ich comprehends, selects the contents through his attentional and perceptual abilities, gives meaning to that information, accepts and assimilates His cognitive abilities, present environment and needs, and past experiences - all participate to create knowledge. That is why knowledge held by someone else can be different from that of his own.
5. **Involvement of the Learner**: This approach emphasizes the importance of learner's active involvement in the learning process. Unless the learner is vigorously involved in learning he cannot be able to construct knowledge. Here, learner does not merely receive the information, reflects upon what he has received and assimilates, but he really looks

for the meaning and will not be accepting that without knowing the full and complete information through his own efforts.

6. **Motivation is the Key Component**: In this approach the learner's active role in learning process, can be delineated by the level of motivation of the learner for learning. Sustenance and continuation of motivation for learning is strongly related to learner's confidence in his cognitive abilities. 7. Learning is an Individualistic Endeavour where as his Volition and Urge to Learn is Important: Learner is a unique individual. His experiential and phenomenological world is his own private, personal world of his being. The environment within the class and outside it is his world of practical life, from where he gets contents for learning. According to this approach, the learner takes his own initiative to discover the environment for intended learning. He utilizes his past experiences and cognitive abilities to unearth the knowledge and accepts it, learns and internalizes the new facts or information. All this process is guided by his own volition and urge to get knowledge. No doubt, the role of parents and especially of teachers is of great significance when the child gets into schooling. But in a way their help and guidance is to supplement child's efforts of discovering and enquiring about the contents of his environment, of which original source is his impelling urge to explore and construct knowledge. Therefore, the basic intent of constructivism is individualistic. The bask urge to know lies within the learner, the sociocultural environment provides him the necessary conditions for exploration and discovery of material from where he can dras and construct information he desires.

The Role of the Teacher

Constructivism intends to assign learner a very active role of earnest involvement in the process of learning. At the same time this approach supposedly does not make teacher altogether passive and sluggish in the process of teaching and learning.His role and responsibilities also carry importance.

1. **Teacher as a Facilitator**: According to this approach teacher is desired to adapt to the role of a facilitator. Under the purview of this approach teachers are generally taken as instructors. As a facilitator, the teacher's job is to help the learner to get to his/her own understanding of the contents. A facilitator needs to display a totally different set of skills to the learners. For facilitating the learning process he provides guidelines and creates environment for the learner to arrive at his own conclusions. He uses his own knowledge and experiences to steer the learner's learning process.

2. **Presentation of Subject-matter:** Where the planning and management of subject-matter is concerned, it is viewed that the fundamental concepts of any subject may be taught to any individual at any stage of learning in one way or the other. Here, it is meant that the teacher (instructor) first introduces the basic ideas or concepts which give a shape to any content of the subject and incites initiation in the learners. Then he revisits and builds upon these repeatedly.

3. **Shaping and Sub-dividing the Curricula**: Curriculum is planned and organized for the facility of the teachers so that they may be able to carry out the teaching process in a guided manner. But following constructivist approach it becomes inevitable on the part of the teacher to shape the curriculum and form its subdivisions meeting the needs of the learners. It is something personal and different which may reflect the belief system of the teacher, his thoughts and feelings about both for the contents of material and his learners. This makes teaching-learning a shared enterprise.

4. **Teacher as a Counsellor**: While propagating his views about discovery learning adopted by learner, Bruner anticipates and describes a number of hazards and difficulties which the learner may encounter while processing his pursuit of self-discovery especially in the learning of new and complex concepts. In such situations, teacher's role as an expert counsellor is of great importance whose timely help/suggestions may make the learner's efforts less cumbersome.

5. **Use of Good Methods for Structuring Knowledge**: Good methods for structuring knowledge simplify the concepts, generating new propositions and increasing the manipulation of information. It is this skill of teacher that makes learning process for learners something convenient and comfortable.Constructivist theory is based on the belief that real learning occurs when the learner constructs his personal knowledge and understanding being an active participant of the learning process. Good learning can take place when learners engage in dialogue and discuss about different concepts, things and events with others-may be the students or the teachers. All constructivists support the pedagogy that promotes teaching techniques which build upon knowledge and concepts learners already know or understand. This prior stock of knowledge is called, "mental structures" that represent the known aspects of the learner's world. Therefore, the teacher is likely to present an organized body of knowledge based upon of mental structural network of learner's cognitions so that he can further expand and elaborate his cognitive abilities.

6. **Use of Appropriate Methods:** While adopting constructivist approach, learning experiences and activities should be so planned and developed as to facilitate the use the methods like discovery method, inquiry training, concept of attainment modes, problem-solving and project methods, assignment method and cooperative learning, etc. The teacher under this approach makes adequate use of all these methods.

7. **Presentation of Rich and Stimulating Environment:** Constructivist learning cannot take place in isolation, ignoring and negating the importance and lively interaction with the environment within and outside the classroom. Social interaction, on the part of learner, is important for certain reasons: (i) Social and cultural environment of child is helpful as it presents rich and useful conditions with a variety of stimuli necessary for appropriate learning; (ii) It provides meaning to the learning output of the learners. (iii) Sociocultural tools like language, concepts and mental images and social interaction, etc. help learner to build up his own personal understanding of the concepts, and (iv) Help

and guidance of parents, teachers and other significant and more experienced persons facilitate the path of learner's exploration of the world and consequently constructing his personal knowledge. It is a part of teacher's responsibilities for planning and developing adequate learning experiences through (1) learner's dialogue with parents and others when it becomes necessary, (ii) Active interaction through group discussion, and (iii) Learner's adequate participation in social and community activities.

Bruner (1966) has asserted that method of instruction should take into consideration the four major aspects such as: 1. Predisposition towards learning. 2. The ways in which body of knowledge can be structured so that it may be readily grasped by the learner. 3. The effective sequence of presenting the subject-matter. 4. The nature and schedule of administering reward/ reinforcement. These aspects evidently clear the importance of the role of teacher (as an instructor) in constructivist teaching.

The Teaching-Learning Process

1. **Mutual Sharing and Negotiation:** Unlike traditional teaching-learning strategies, planning and development of learning experiences is not a sole responsibility of the teacher in the constructivist approach. Woolfolk (2004) (strongly contends that in constructivist approach the job of planning for learning experiences and making adequate arrangements for them are mutually shared and negotiated by the learners and the instructor. The learners and the teacher both make decisions about the contents, activities and approaches associated with classroom teaching and learning Teaching-Learning Process out in the experiences, or otherwise learning activities carried environment outside the classroom.
2. **Flexibility and Dynamism in Framing Curriculum:** Under constructivist teaching approach prescription of no fixed curriculum is advisable. More stress is on self-initiative and self-learning in search and development fixed Crucial of knowledge by the learners. They are desired to discover and construct new facts and knowledge for themselves. Realizing the complexities and intricacies involved in such an autonomous process of

learning and immaturity on the part of the learners some framework of the curriculum is considered inseparable to provide helpful guidelines. Therefore, some desirable flexibility needs to be adopted in terms of selection of contents of the material and their presentation.

3. **Teaching-Learning Objectives**: Those who support and go in for the adoption of this approach, they do not recommend any definite and predetermined set of teaching. learning objectives like all other traditional approaches. This approach does not strictly specifies the nature and extent of not behaviour changes in the cognitive, conative and affective domains of learners. It advocates the use of cognitive abilities by the learners when they discover and unearth facts and construct knowledge through their own efforts. Therefore, the teacher is desired to have a broad vision and should set big- ideas, and goals, the process of their achievement should start from the existing knowledge of the learners that may present a strong base for the development of "big-ideas". So, the teaching-learning process is based upon the framework of the fundamental philosophy of constructivism.

4. **Availability of a Wide Variety of Experiences:** In teaching-learning process, the learning experiences and activities are desired to be planned and organized in a such a way that learners may get the opportunities to have very wide variety of experiences to construct knowledge and discover new facts by themselves.

5. **No Set Patterns of Activities**: This approach supports the very idea of self-exploration and self-discovery (on the part of the learners) of the environment so that the learners may get the ideas or events to be explored further. But their activities are not to be guided by the pre-determined set of patterns. In fact, teaching-learning process should be such that it may induce a state of disequilibrium in the learners. In other words, learners should face or deal with some harder type of ideas/problems not merely the problems based on their experiences of dealing with simpler concepts and problems. These somewhat harder

and complex type of problems will create a state of disequilibrium in the learners, and it will impel them to discover new means of knowledge to solve these problems.

6. **Learning as a Social Process:** This approach evinces that teaching-learning is a social process which facilitates the learning process for the learner and proves to be beneficial both for the learners and the teacher. Through this active process of social learning learners learn to discover principles, concepts and facts, and while helping learners in carrying over this process, the teacher also comes across new ideas and many new vistas of knowledge. Many theorists agree that through this social process of learning individuals make many new meanings of the things of the environment they live in. Thus, knowledge is an outcome of socially and culturally conducted process of learning activity. Learning is essentially a social process. It is not something that takes place in the minds of individuals, nor is it a passive development of some behaviours which are shaped by external forces, rather meaningful learning occurs when individuals engage in social activities.
7. **Collaboration among the Learners**: On many occasions individualistic learning takes place in learners. But under the purview of this approach learners for achieving some difficult and (may be) higher objectives may undertake collaborate efforts, share experiences, discuss the diverse phenomena, and have productive dialogue with peers on different concepts or different aspects of events or situations present in the environment.
8. **Make the Contexts Viable and Obtainable**: The Contexts of the material presented to the learner or the environment where activity on part of learner is desired to be executed, should be clear, meaningful and obtainable. It is essential that material to be presented to the learners must be meaningful and useful for the learners and that should be within the reach of the cognitive abilities of the learners. The contexts of learning should be central to the learning itself. In constructivist approach there is one basic assumption that "There is no one set of generalized learning laws with each law applying to all domains" of learning. Therefore, here the teacher takes care that the learning process in which learners carry out activities should have direct relationship with the learning and the culture in which the process is to be carried out.

9. **True Potential is to be Evaluated**: Assessment is a part of every teaching-learning system. Its main objective is to see that whether the predecided objectives of teaching and learning have been obtained, and how far they have been successful in achieving their respective objectives. In constructivist approach it is not the output (like the traditional pattern of assessment) which is stressed upon but rather it is essentially the true potential of the learners which is given importance. In constructivism, the assessment is a two-way process involving interaction between the learner and the teacher. The evaluator sets a stage of dialogue with the learner (whose performance is being assessed) to find out his current status of performance on some specific task or activity. Feedback from the concerned learner is also considered quite worthwhile. Learner and the teacher also find out the ways and means to improve upon the performance on subsequent occasions. Thus, learning and evaluation are highly mutually interlinked concepts and are not the two separate processes In this approach the instructor (teacher) accepts the assessment as a continuous and interactive process that measures achievement of the learner, the quality of teaching experiences and the contents of the course work.