Chapter-X

(Constructivism and Zone of Proximal Development for teaching learning activities)

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Constructivism is a psychological theory of knowledge that signifies that humans generate knowledge and meaning from their experiences. Constructivism is an approach to learning developed by Piaget's and associates. They asserted that constructivist learning happens especially, when people are engaged in constructing a product, something external to themselves such as a computer program or a book. 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 OF CONSTRUCTIVISM (BY PIAGET)

Concept of constructivism is given by Piaget in his theory of cognitive development. Piaget designed a framework to understand the structure, functioning and development of the cognitive network abilities of the human mind. According to him, children are active thinkers who are constantly trying to construct more accurate and advanced understanding of the world around them. In other words, from this perspective, children construct their knowledge of the world by interacting with it. Initial cognitive structure of a child is supposed to incorporate only those cognitive abilities and potentials which help him

to do some acts. His work on the development of knowledge and understanding is based upon the view that there is set of processes which are unconsciously put into action each time we encounters information from any of our senses. Piaget explained three 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. Firstly, the assimilation involves the incorporation of new information or knowledge into existing structure of knowledge known as schemas (Schemas- All living, thinking beings have a set of rules which are variously known as 'scripts', schemas are used to interpret their everyday surroundings). Piaget named these abilities or potentials as schemas. They involve our tendency to fit new information into existing mental frameworks. Our schemas are very large and constantly growing and there are great many links both within and between our schemas. It is actually 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 the new incoming information. This happens when we are puzzled and surprised by something which we experience i.e. 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. The various schemas 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.

1. Assimilation is the process of 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 new information is encountered, this is added to the existing schema which is assimilated. However, it will only be assimilated if it does not contradict something already established as an integral part of what exists. This process is linked very closely to accommodation.

2. Accommodation involves modifications in existing knowledge structure/schema as a result of exposure to new information or experiences. It is our tendency to alter existing concepts or mental frameworks in response to new information of the external world. Hence, accommodation is the alteration of a schema in order for new and contradictory information to be allowed.

According to Piaget, as 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 plays a major role in its functioning. So, 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/ social environment. On the other hand, the individual has to adapt to his environment for survival as well as proper growth and development. Thus key to his cognitive development lies in his constant interaction with an adaptation to his physical and social environment. Such adaptation is carried out through the above two processes i.e. assimilation and accommodation.

3. Equilibratiom is the state of having no contradiction present in our mind of our environment. The linked processes of assimilation and accommodation are the means by which a state of equilibrium is attained. Equilibration is said to follow a threefold path.

(i) First, we are fully satisfied with our thought process and said to be in a state of equilibrium; (ii) Second, if we are aware of a shortcoming /contradiction in our existing thinking process, we become dissatisfied and enter in a disequilibrium state; we experience cognitive conflict. (iii) Thirdly, we move to a more enlightened mode of thought. We are able to delete the contradiction of the previous mode and in that way regain our equilibrium state.

Hence, assimilation is the process by which schemas are reorganized and developed. New information can be assimilated if it does not contradict the existing schema. Schemas are modified and restructured when we come across new alternate or contradictory information arises — this is accommodation. Equilibrium is a state of balance for a schema when there are no conflicting elements in mind. Equilibrium is the state which is desired by individuals innately.

STAGES OF COGNITIVE DEVELOPMENT

In cognitive development of children and adolescents. Piaget explained four major stages: sensori-motor, pre-operational, concrete operational and formal operational. Every child goes through these stages in the same order. Each child's development is determined by his biological maturation and interaction with his environment. There are individual differences in the rate at which children progress through these stages, and some individuals may never attain the later stages. Further, Piaget did not make a claim that a particular stage was reached at a certain

age - although detailed description of the stages often include an indication of the age at which the average child would reach. Piaget's four stages of cognitive development are:

i. Sensory-motor stage (birth to age 2)

ii. Pre-operational stage (from age 2 to age 7)

iii. Concrete operational stage (from age 7 to age 11)

iv. Formal operational stage (age 11+).

i) In the Sensory-motor Stage (Ages: Birth to 2 Years) infant knows the world through their movements and sensations. Children learn about the world through basic actions such as sucking, grasping, looking, and listening. Infants learn that things continue to exist even if they cannot be seen (permanence of objects).They realise that their actions can cause things to happen around them. A child's entire experience at the earliest period of this stage occurs through basic reflexes, senses, and motor responses. It is during the sensory motor stage that children go through a period of dramatic growth and learning. As kids interact with their environment, they are continuously making new discoveries about how the world works. The cognitive development that occurs during this period takes place over a relatively short period of time and involves a great deal of growth. Children not only learn how to perform physical actions such as crawling and walking but they also learn about language from the people with whom they interact. It is during the final part of the sensory motor stage that early representational thought emerges. Piaget believed that developing object permanence or object constancy

was an important element at this point of development. By learning that objects are separate and distinct entities and that they have an existence of their own outside of individual perception, children are then able to begin to attach names and words to objects.

ii) In the Preoperational Stage (Ages: 2 to 7 Years) Children begin to think symbolically and learn to use words and pictures to represent objects. Children at this stage tend to be egocentric and struggle to see things from the perspective of others. While they get better with their language and thinking, they tend to think about things in very concrete terms. Major Characteristics and Developmental Changes Rapid language development. Language development is one of the major hallmarks of the preoperational stage of development. No logical thinking at this stage and kids struggle with logic and taking the point of view of other people. Role-playing also becomes important during the preoperational stage. Children often play the roles of different characters such as, mommy, daddy and doctor etc., and many other characters. Egocentric: Children's' thoughts and communications are typically egocentric, the egocentric child assumes that other people see, hear, and feel exactly the same as the child does. During this stage children have difficulties thinking about more than one aspect of any situation at the same time; and they have trouble decentering in social situation just as they do in non-social contexts. During the preoperational stage, children also become increasingly adept at using symbols, as evidenced by the increase in playing and pretending.

iii) In the Concrete Operational Stage (Ages: 7 to 11 Years) children begin to think logically about concrete events. They begin to understand the concept. Their thinking becomes more logical and organized, but still very concrete. Children begin using inductive logic or reasoning from specific information to a general principle. Major Characteristics and Developmental Changes Logical thinking. The egocentrism of the previous stage begins to disappear as kids become better at thinking about how other people might view a situation. While thinking becomes much more logical during the concrete operational state, it can also be very rigid. Child at this point in development tend to struggle with abstract and hypothetical concepts. Child in the concrete operational stage also begins to understand that their thoughts are unique to them and that not everyone else necessarily shares their thoughts, feelings, and opinions. Classification is the ability to identify the properties of categories, to relate categories or classes to one another, and to use categorical information to solve problems. One of the most important developments in this stage is an understanding of reversibility or awareness that actions can be reversed.

iv) In the Formal Operational Stage (Age 11+) adolescent or young adult begins to think abstractly and reason about hypothetical problems. They begin to think more about moral, philosophical, ethical, social, and political issues that require theoretical and abstract reasoning. Begin to use deductive logic, or reasoning from a general principle to specific information. The final stage of Piaget's theory involves an increase in logic, ability to use deductive reasoning, and an understanding of abstract ideas. At

this point, people become capable of seeing multiple potential solutions to problems and think more scientifically about the world around them. The ability to thinking about abstract ideas and situations is the key hallmark of the formal operational stage of cognitive development. The ability to systematically plan for the future and reason about hypothetical situations are also critical abilities that emerge during this stage. It is important to note that Piaget did not view children's intellectual development as a quantitative process; Instead, Piaget suggested that there is a qualitative change in how children think as they gradually progress through these four stages. Science and mathematics often require thinking about hypothetical situations and concepts. In earlier stages, children used trial-and-error to solve problems. During the formal operational stage, the ability to systematically solve a problem in a logical and methodical way emerges. Children at the formal operational stage of cognitive development are often able to plan quickly an organized approach to solving a problem.

Educational Implications of Piaget's Theory

These theories focused attention on the idea of developmentally appropriate education—an education with environments, curriculum, materials, and instruction that are suitable for students in terms of their physical and cognitive abilities and their social and emotional needs. This theory has been influential in constructivist models of learning. The main teaching implications drawn from Piaget as follows

1. A focus on the process of children's thinking, not just its products. In addition to checking the correctness of children's answers, teachers must understand the processes children use to get to the answer. Appropriate learning experiences build on children's current level of cognitive functioning, and only when teachers appreciate children's methods of arriving at particular conclusions – are they in a position to provide such experiences.
2. Recognition of the crucial role of children's self initiated, active involvement in learning activities. In a Piaget's classroom the presentation of ready-made knowledge is not emphasized, and children are encouraged to discover for themselves through spontaneous interaction with the environment. Therefore, instead of teaching didactically, teachers provide a rich variety of activities that permit children to act directly on the physical world.
3. A de-emphasis on practices aimed at making children adult like in their thinking. Piaget based educational programs accept his firm belief that premature teaching could be worse than no teaching at all, because it leads to superficial acceptance of adult formulas rather than true cognitive understanding
4. Acceptance of individual differences in developmental progress. Piaget's theory assumes that all children go through the Constructivism same developmental sequence but that they do so at different rates. Therefore, teachers must make a special effort to arrange classroom activities for individuals and small groups of children rather than for the total class group. In addition, because individual differences are expected, assessment of children's educational progress should be made in

terms of each child's own previous course of development, not in terms of normative standards provided by the performances of same age peers. The teachers main role is the facilitation of learning by providing various experiences for the students. Opportunities that allow learners of different cognitive levels to work together often help encourage less mature students to advance to a higher understanding of the material. One future implication for the instruction of students is the use of hands on experiences to help students learn.

Some general suggestions

- The use of concrete props and visual aids, such as models.
- Facilitate learning by using familiar examples to explain complex ideas, such as a story problem in math.
- Give students the opportunities to classify & group information, use outlines & hierarchies to facilitate assimilation of new information with previously learned knowledge.
- Present problems that require logical analytical thinking, brain teasers are a great way to incorporate this.

Zone of Proximal Development

This is an important concept that relates to the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from a skilled partner. For example, the child could not solve the jigsaw puzzle by itself and would have taken a long time to do so (if do himself), but was able to solve it following interaction with the father/teacher, and has developed

competence at this skill that will be applied to future jigsaws. Vygotsky (1978) sees the Zone of Proximal Development as the area where the most sensitive instruction or guidance should be given- allowing the child to develop skills they will then use on their own - developing higher mental functions. He also views interaction with peers as an effective way of developing skills and strategies. He further suggested that teachers use cooperative learning exercises where less competent children develop with help from more skillful peers - within the zone of proximal development.

Classroom Applications

1. *Reciprocal teaching* is a contemporary educational application of Vygotsky's theories,used to improve students' ability to learn from text. In this method, teachers and students collaborate in learning and practicing four key skills: summarizing, questioning, clarifying, and predicting. The teacher's role in the process is reduced over time.

2. *Collaborative learning*: Vygotsky's theories also feed into the current interest in collaborative learning, suggesting that group members should have different levels of ability so more advanced peers can help less advanced members operate within their zone of proximal development.

3. *Use of technology*: Technology can be used to facilitate learning within the Zone of Proximal Development (ZPD). Online activities and projects can encourage the co- operation of students even when not in the classroom. Teachers can use videos and interactive worksheets to engage their students and assist them.

4. *Knowing both levels of Vygotsky's zone*: Knowing both levels of Vygotsky's zone is useful for teachers, for these levels indicate where the child is at a given moment as well as where the child is going. According to him, for the curriculum to be developmentally appropriate, the teacher must plan activities that encompass not only what children are capable of doing on their own but what they can learn with the help of others.Teachers can use information about both levels of Vygotsky's zone of proximal development in organizing classroom activities.

5. *Importance to language learning*: Since language holds a central role in Vygotsky's theory, and is essential to the development of thinking, the school needs to provide many opportunities that allow children to reach the third stage of speech, which is inner speech, since it is this stage which is responsible for all higher levels of functioning.

6. *Scaffolding* is a tactic for helping the child in his or her zone of proximal development in which the adult provides hints and prompts at different levels. In scaffolding, the adult does not simplify the task, but the role of the learner is simplified through the graduated intervention of the teacher. Scaffolding provides the following advantages: i) It provides clear directions for students ii) It clarifies purpose of the task iii) It keeps students on task iv) It offers assessment to clarify expectations v) It points students to worthy sources vi) It reduces uncertainty, surprise and disappointment vii) It delivers efficiency viii) It creates momentum.

7. *Importance of Language*: Vygotsky puts great emphasis on language. He views that language is not just a mean of expression, it is a mean of thought. The development of language is considered to be a major

principle of Vygotsky's Socio-cultural theory. The language of a certain group of people indicates their cultural beliefs and value system. Vygotsky states that humans may have "built in basis, rules and constraints about language that restrict the number of possibilities considered. A child thinking regarding these language constraints is very important in language development.

Vygotsky's theory invites us to consider the possibility that children understand those things that are common features of their social experience. Vygotsky proposed that language allowed the child a far greater freedom of thought and lead to further cognitive development as oppose to Piaget who believed that it moved from individual to social. For Vygotsky speech moved from social speech (communication) to inner egocentric speech. Vygotsky shares some important areas of agreement with Piagetian theory, particularly an emphasis on activity as the basis for learning and for the development of thinking but Vygotsky emphasis more on the role of communication, social interaction and instruction in determining the path of development than Piaget. Vygotsky argues that the capacity to learn through instruction is itself a fundamental feature of human intelligence.

Exercise

1.Exlain the concept of constructivism and stages of cognitive development in detail.

2. Explain the Zone of Proximal Development in detail with its educational implications.

3. What are the educational implications of Piaget's stages of cognitive development?