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Nursery Education

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UNIT FOUR

Piaget's Theory of Intellectual Development

4.1 Introduction

Jean Piaget, a Swiss psychologist made a notable contribution to our understanding of the child, in his theory of intellectual development. He viewed the course of intellectual development in terms of progressive changes in cognitive structures. Even though all the children do not go through his stages at the same age, it can be observed however that all children proceed through the stages in the same order in all cultures as the changes are controlled by maturation found in all cultures.

The stages identified by Piaget were:

1. The Sensorimotor period (0–2 years)
2. Pre-operational period (2–6 or 7 years)
3. Concrete operations (6 or 7 through 11 or 12 years)
4. Formal operations (11 or 12 years onwards).

4.2 The Sensorimotor Period

It is during the first two years of life that sensorimotor co-ordinations form the action basis for subsequent symbolic thought. Sensorimotor co-ordinations include: looking at things heard by the child, grasping at things seen and heard and manipulating things seen.

During this stage, the child makes a transition from a reflex organism to that of someone possessing rudimentary symbolic thought. Through his motor activities of reaching and grasping objects, the child becomes aware of spatial relationships.

4.2.1. Significant learnings occuring during this period:

1. The child learns the concept of *object permanence.* The child discovers that objects for instance do not "disappear" when they are out sight.
2. The child is able to perceive certain aspects of the environment as *invariant,* the notion that while objects or people may appear in different contexts, their identity does not change. An example is the

child's ability to recognize mother or father when either is dressed in different clothings.

3. The child can also learn at this stage that certain actions have certain effects on the environment. That is, the child has developed an elementary or rudimentary concept of causality.

Piaget has divided the sensorimotor period into six sub-stages:

4.2.2. The six stages of the period of sensorimotor Development.

Stage	Approximate Age	Brief Description
1. Exercising ready-made sensorimotor equipment	0–1 Month	Child actively exercises the reflexes present at birth; behaviour is largely sucking, crying and eliminating. Assimilation and accommodation are not differentiated.
2. Primary Circular reactions	1–4 Months	Involves co-ordination of reflexes and responses, hand movements become co-ordinated with eye movements, child looks for what he hears, reaches for objects, grasps and sucks them. Assimilation and accommodation become differentiated.
3. Secondary Circular reactions	4–8 Months	Infant begins to crawl and manipulates objects, child intentionally repeats actions that produce interesting and enjoyable results.
4. Co-ordination of Secondary schemes	8–12 Months	Child turns bottle to reach nipple, sets an obstacle aside to reach desired object visible behind it. Child uses previously learned responses to attain goals.

5. Tertiary Circular reactions	12–18 Months	This stage is characterized by active experimentation, novelty seeking, exploration variation and modification of behaviour.
6. Invention of new means through mental combinations	18–24 Months	Child solves a detour problem by going round a barrier even it means temporarily moving away from the goal, infer causes from observing effects, predicts effects from observing causes, invents new applications of something learned in a different context.

4.3 The Pre-operational Period

The second broad period of intellectual development, according to Piaget, is the pre-operational period from 2–6 or 7 years. In this period, the following are observable:

(1) development of symbolic function
(2) symbolic use of language
(3) intuitive problem solving
(4) child's thinking is characterized by irreversibility centration and egocentricity.

Piaget divides the pre-operational period into two sub-periods:

(a) the pre-conceptual period (2–4 years) and
(b) the intuitive period (4–7 years)

During the early part of the pre-operational period the child is egocentric. That is the child is centered about himself. The child is unable to take another person's point of view. Children between 2–4 years have no real conception of abstract principles that guide classification. The child's judgement is based upon his perception of "before the eye" reality. The child is unable to conserve number in the face of irrelevant formation. For example, if you show a child two rows of sticks, each row containing six sticks of equal size and if the sticks in one row are spaced at wider intervals than the other

row, the pre-operational child is likely to say that the more widely spaced row contains more sticks.

At this age also, the child cannot deal with *class inclusion* as he cannot reason simultaneously about a part of the whole and the whole. The child at the pre-operational stage can attend to only one object, property or experience at a time. Multiple classification is beyond his power of combinatory thought. He experiences great difficulty in establishing super-ordinate conceptual categorizations in problems that require the achievement of higher-order abstractions. For example, a pre-operational child may correctly agree with you that an orange is a fruit, but may also indicate that if all the oranges in the world were to be eaten, there will be no more fruits left. The child sees the surbordinate class orange to be equivalent to its super-ordinate class fruit.

At abouty 4–7 years, the child builds thought which is intuitive because they are built up from mere impressions. Apart from the child's lack of conservation (that no change has occurred in one or more aspects of an object in spite of changes in perceivable features) he or she is unable to handle problems of ordering or seriating. A four-year-old may not be able to arrange sticks of different heights in order. Another important characteristic of the pre-operational reasoning is irreversibility – the child does not see that every logical operation is reversible.

Other aspects of the pre-operational period are that:

(a) the child has the tendency to attribute life or consciousness to inanimate objects (animism) for example, when movements are observable in the cloud;
(b) the child has the tendency to conceive all subjects in the world as the product of human creation and made for our own purposes (artificialism);
(c) the child has the tendency to view some psychological phenomena such as dreams as concrete and real experiences (realism).

4.4. Period of Concrete Operations

The major characteristics and achievements during this period include conservation of mass, length, weight and volume, reversibility, decentration, ability to take the role of others, logical thinking involving concrete operations of the immediate world, classification (organizing objects into hierarchies of classes) and seriation (organizing objects into ordered series such as increasing height).

The operational child understands relationship between classes and sub-classes. The child's logic and objectivity increase and the child begins to think deductively. In the period of concrete operation, the child is beginning to ultize symbolic thought and is building the foundations for logical thinking which characterizes the adolescent. The child has the idea that in thoughts, steps can be retraced, actions can be cancelled and the original situation can be restored. The child has the ability to think about the parts and the whole independently in part-whole relationships and to perform multiple classification (class inclusion).

4.5. Period of Formal Operations

The period of formal operations begin at about age twelve. The child demonstrates flexibility, abstraction, mental hypotheses testing and consideration of possible alternatives in complex reasoning and problem solving. The child can also assimilate and combine informations from a variety of sources. This period begins in early adolescence. The adolescence can hold many variables in mind simultaneously. He can follow the form of an argument while disregarding its concrete content, hence the term formal operations.

4.6. Curriculum Implication of the Piagetion theory for the Pre-School Child

According to Piaget himself, he suggested that teachers may apply his theory in the classroom by:

(1) providing children with actual objects to manipulate;
(2) assisting children in their development of question-asking skills; and
(3) knowing why particular operations are difficult for children.

Attempts have also been made by others to suggest educational activities based on the Piagetian theory, notably Lavatelli, Kamii and De Vries, while the efforts to make something practical of Piaget's theory has been the recent upsurge in Montessori schools.

For children who are between 4–7 years, Lavatelli felt that the general objective of the curriculum should be the development of intellectual competence through self-activity and questioning.

Three kinds of knowledge for Piaget-based early childhood curriculum development are:

(1) development of physical knowledge;
(2) development of social knowledge and

(3) development of logical knowledge.

Thus, to develop physical knowledge in the child, activities should be provided for the child to learn about ther nature of matter, the child is encouraged to develop his knowledge of the properties of the objects encountered in the environment such as weight, form and texture through his manipulation of several objects. The child, may be encouraged to perform simple experiments like measuring water, cutting papers with scissors into different shapes and sizes.

To develop social knowledge in the child, activities should be provided to encourage knowledge of social informations such as social or occupational roles. Activities may also be provided to encourage knowledge of norms for social conduct such as table manners or cooperative plays. Through modelling of cooperative behaviour, stories, settings can be provided for the child to construct moral values.

In the development of logical knowledge (which include the logico-mathematical and spatio-temporal operations) activities may be provided to encourage *(a)* classification, *(b)* ordering or seriation and *(c)* spatial relations and *(d)* temporal relations.

Group and classification: The child can be made to relate things that go together or the child can be asked to make functional discrimination. Things may go together either because they are used for some activity. For example, a child may relate fork to spoon as they are both used for eating. Child may be encouraged to group objects according to size, shape or colour. A child can be encouraged for example to look within his immediate environment for materials that have the same colour with a specific, named colour in the class.

Ordering or Seriation: The child, while manipulating objects, may be encouraged to deal with them in terms of their relationships in size, quantity, quality or temperature, using descriptive words such as big or little, more or less, rough or smooth and hot or cold.

Spatial relations: Spatial relations can be dealt with by allowing the child to make expressions of the orientation of his body to the orientation of other objects in space using expressions such as "near or far", "moving towards and away from", "inside or outside". The child's understanding of the concepts of distance, direction and position will aid him in the development of meaningful construction of space and spatial relationships.

Temporal relations: Through games and other recreational activities, the child may begin to deal with terms like first and last, beginning and end. Interaction with peers is important to liberate

the child from his egocentrism. In group activities, the child may be given the opportunity to take the perspective of the other. By giving the child multiple experiences in the classification and categorization of objects, it is believed, a more extensive and varied world could be opened up to the child which he could approach with increased flexibility.