

Quadrant II – Notes

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Educational Implications of Jean Piaget: Cognitive Development

Jean Piaget was a Swiss psychologist and the most influential researcher in the area of developmental psychology. He was the first to make a systematic study of the acquisition of understanding and cognitive development in children. He found that,

- Intelligence is the ability to adapt to the environment.
- Children learn by building cognitive structures (schemas) through which they understand and respond to their physical environment.
- Structures increase with growth and development.
- They make sense of their experience and adapt effectively to their external world.

Three key concepts (applicable to any age):

- Assimilation
- Accommodation
- Equilibration

1. Assimilation

The process of taking in new information into our previously existing schema to deal with a new object or situation e.g., different types of dogs.

2. Accommodation

A process of modifying the existing abstract mental structures called schemas, or ideas as a result of new information or new experiences. Through accommodation the child adapts to the new situation e.g., dogs and cats are similar but different.

3. Equilibration

- Equilibrium occurs when a child's schemas can deal with most of the new information that is assimilated (disequilibrium on the other hand is an unpleasant state when new information is difficult to assimilate).
- Equilibration is a balance between assimilation and accommodation and can help a child to move from one cognitive stage to another.

Adaptation: Adaptation is brought about through the processes of Assimilation and Accommodation. It is through adaptation that a child grows in awareness and experience of

the outside world. Cognitive development is predictable as it goes through certain definite stages.

Stages/Periods of Cognitive Development:

1. Sensorimotor Stage (birth to 2yrs).
2. Preoperational Stage (2-7yrs).
3. Concrete Operational Stage (7-11yrs).
4. Formal Operational Stage (11---).

These four stages follow a characteristic pattern:

Every stage is a structured whole and is in a state of equilibrium.

Every stage is built upon the previous stage and is enriched through assimilation and accommodation.

All stages follow a definite sequential order and are universal across cultures and regions. While the progression from stage to stage is gradual, they are not identical.

1. The Sensorimotor Stage (Birth to 2 yrs)

Children at this stage,

- Coordinate their sensory experiences (seeing, hearing) with motor actions (reaching, touching, grabbing).
- Develop Object Permanence (memory)
- Progress from reflexive, instinctual actions at birth to the beginning of problem solving (intellectual) and symbolic abilities (language) toward the end of this stage.

2. Preoperational Stage (2 to 7 yrs) (Toddler and Early Childhood)

Children at this stage are already capable of using more complex mental representations like words and images, symbols, memory and imagination.

- Speech becomes more social and less egocentric
- They can understand relationship between the past, present and future.
- They are unable to use logical mental rules, such as arithmetic operations yet.
- They focus on Perceptual Salience.
- They display ego-centricism, animism, centration and conservation.

3. Concrete Operational Stage (7 to 11 years of age) (childhood and early adolescence)

This stage is characterized by the appropriate use of logic. Some of the important processes prominent during this stage are:

1. Seriation
2. Transitivity
3. Classification
4. Decentering
5. Reversibility
6. Conservation and
7. Elimination of Egocentrism

4. Formal Operational Stage (from 11yrs and up) (Adolescence and Adulthood)

At this stage, individuals have:

- Thoughts that are increasingly flexible and abstract, i.e., systematic experiments can be carried out.
- Advanced problem-solving abilities.
- An understanding that nothing is absolute; everything is relative.

- Logical reasoning and systematic planning.
- An understanding that rules are man-made and can be modified by mutual agreement.

Applications of Piaget's Theory

1. Sensorimotor Activities (infant to Toddler)

In the later in this stage, a child learns by trial and error. Hence a rich stimulating environment must be provided (rattles, blocks etc. is helpful).

Peek-a-boo can be a very helpful game at this stage.

2. Preoperational Activities (Toddler and Early Childhood)

- Visual aids, physical props, illustrations and artwork can be provided as these are useful for learning.
- Lessons can include examples from the children's experience since they have difficulty seeing the world from another perspective, other than their own.
- Since learning of facts and skills need physical and a hands-on practice, cut-outs of letters can be used to build words.
- Paper and pencil activities should be minimum and workbooks must be avoided.
- Hands-on activities with physical objects that change shape are useful in understanding conservation and two-way logic.
- Playing with clay, sand or water can be encouraged. Encourage students to talk about what they are experiencing while they play.

3. Concrete Operational Activities (Middle Childhood)

- The use of visual aids and hands-on activities must be continued.
- Opportunities must be given for objects manipulation and testing out of ideas.
- Science must be taught using 3-D models.
- Simple experiments can be suggested with limited number of steps.
- Reading material with limited number of characters must be selected.
- Complex ideas can be explained through examples that are familiar to students to help them understand and process new information.
- Opportunities can be given to group and classify objects and ideas with increasing complexity.
- They can be asked to compare the lives of characters in a story with their own.
- Sentences can be provided on pieces of paper then have them grouped into paragraphs.
- Outlines and analogies can show the relationship of new material to already acquired knowledge.
- Storylines can be used when teaching math problems.
- In math not more than three or four variables must be given at a time.
- In geography, craftwork can be used to teach about various occupations used in the past.
- History can be taught with the help of time lines.
- Problems that require logical and analytical thinking can be given.
- Mind twisters, brain teasers and riddles are ideal at this stage.
- Students can be given open-ended questions to stimulate their thinking.

4. Formal Operational Activities (Adolescence)

Initially, the teaching strategies and materials used at the concrete operational stage such as visual aids, charts and illustrations must be continued. Then a few more complex graphs and diagrams can be incorporated. Step-by-step explanations can be given and materials provided.

- Students must be given the opportunity to explore various hypothetical questions. Have them discuss hypothetical 'other worlds'.

- Students should discuss social issues.
- Students should be encouraged to work in pairs (listener & problem solver) e.g., students should explain how they solve problems. The problem solver works problem out loud, the listener checks to see that all steps are followed and seem logical. Put a few essay questions on tests, which requires the student to give more than one final answer or simply answer from rote memory.
- Broad concepts should be taught rather than just facts.
- Relevant material and ideas should be used e.g., when teaching about Civil War, discuss other issues which have divided our country.
- Poetry can be taught by using lyrics from popular music so also discussions social problems, etc.

Conclusion of the Theory of Cognitive Development

All children don't move from one stage to another at the same time, but from one stage to the next in the same order. Hence, you may have students in your classroom on different levels. There are many practical applications that can be made from Piaget's theory. By using these in our teaching, we can hopefully teach students in a way that will help them be the most effective learners.