

Radical Constructivism Factsheet

Joe Champion

Basic Assumptions (see Merrill, 1991)

- Individuals are active learners and must construct knowledge for themselves
- Endogenous perspective: knowledge derives from reflection and prior knowledge, not directly from environmental interactions. One's mental world is the only reality
- There is a biological drive (called equilibration) to produce an optimal state of equilibrium between cognitive structures and observations of the external environment
- Development is a precondition for learning- knowledge can only be learned at the appropriate developmental stage
- There are 3 kinds of knowledge- physical, social, and logico-mathematical.

Mechanisms for Learning

- Cognitive development and learning begins with experience that causes a disequilibrium or cognitive conflict.
- Assimilation and accommodation are complementary cognitive processes that learners use to resolve disequilibrium.
- Assimilation occurs when complex but familiar objects are simplified to fit into preexisting mental structures
- Accommodation occurs when a learner changes their internal mental structures to adapt to and provide consistency with their perceptions of the external world.
- Relationships are constructed through empirical abstraction (physical properties) and reflective abstraction (relationships between or among objects)

Experiences Forming the Basis for Learning

Children are not born with knowledge; they acquire concepts of the world through normal interactions that are appropriate to their development. External stimuli, including information from social interactions, are processed according to existing mental structures and incorporated into an individual's reality through equilibration.

Results of the Theory

- Much Piagetian research has studied learning within and between the 4 stages of cognitive development.

Stage of Cog. Dev.	Sensorimotor	Preoperational	Concrete Operational	Formal Operational
<i>Approx. ages</i>	0-2	2-7	7-11	11-∞
Typical Characteristics	<ul style="list-style-type: none"> • modifies reflexes to make them adaptive • goal-directed (first concrete, then abstract) • begins mental representations of events and objects 	<ul style="list-style-type: none"> • egocentric thinking • begins symbolic thinking • focuses on one perceptual dimension in problem-solving 	<ul style="list-style-type: none"> • performs mental operations to solve concrete problems logically • has trouble thinking hypothetically and considering all possibilities 	<ul style="list-style-type: none"> • uses systematic and logical operations to solve abstract problems • thinks hypothetically • considers social issues (less narcissism)

- Young children may not be able to test hypotheses and generate abstract relationships (e.g., Angles of a Triangle, Bending Rods)
- *Conservation Tasks*- preoperational children do not conserve quantities when they are spatially rearranged (e.g., the flowers and the vases correspondence is lost when the flowers are spread out)
- *Connexity Tasks*- although they may have constructed the concept of number, preoperational children often do not recognize that all quantities are connected through the operation "+1" (e.g., blocks in a row vs. blocks in a pile)

Teaching Implications

- Understand individual students' stages of cognitive development and set-up developmentally appropriate tasks.
- Keep students working actively and exploring with manipulatives and hands-on activities (facilitates active construction of relationships).
- Set-up conditions for cognitive disequilibrium. Material should be difficult enough so that it cannot be easily assimilated, but easy enough so that it can be accommodated into existing schema.
- Provide social interaction so that students can learn other points of view (reduces egocentric thinking)

Major Contributors



Jean Piaget

Jean Piaget (1924-1990)

- biologist developmental psychologist
- Developed the four stages of cognitive development
- Used equilibration, assimilation, and accommodation to describe learning
- Proponent of active learning tasks



Ernst von Glasersfeld

Ernst von Glasersfeld (1980-1997)

- philosopher and "cybernetician"
- Coined the terms radical and trivial constructivism
- Elaborated on Piaget's epistemology
- Stressed the importance of fit and viability as measures of knowledge

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