

Augustana College

EDUC 245 – Educational Psychology & Measurement

Concepts addressed:

Theoretical Foundations about How Learning Occurs: How Students Construct Knowledge, Acquire Skills, and Develop Habits of Mind

Piaget's cognitive theory is based upon four beliefs:

- 1) Children are motivated to learn
- 2) They construct their own knowledge from information and experience
- 3) Interaction with the physical and social environment is required for cognitive development
- 4) The quality of thought increases as development progresses. Students are constantly trying to understand their world

In order to do this they create and change their schemas (concepts and skills) to fit their environment. To learn information students use assimilation, accommodation, and organization. The learning process is as follows: an individual is in a state of equilibrium when they understand and are able to explain information; everything fits into their schema. Information that is presented that doesn't fit into their schema creates a state of disequilibrium (agitation, a very uncomfortable state, they don't understand what the teacher is talking about) and they try through assimilation, accommodation or organization to make sense of the new information. When they successfully understand the new information they are in a state of equilibration - the new information fits into existing or newly created schema.

Vygotsky's socio-cultural view of cognition maintains that cognitive development happens in a social context. Student interaction with more knowledgeable and capable individuals is required for learning to take place. Parents, teachers and more able peers assist the student in learning. Vygotsky states that learning happens at two levels, the social level and the traditional academic level. At a social level we learn things such as language, humor, and cultural practices. At the academic level we learn school subjects like math, science, and language arts. Vygotsky's theory emphasizes the importance of language in cognitive development and encourages private speech (for younger children this means talking aloud to oneself) to guide thinking. He believes teachers need to identify student's zones of proximal development (one student may have many different zones of proximal development - one in addition, another in subtraction) and then scaffold the content and strategies appropriately. Students need to take on more of the responsibility for their own learning as they master concepts and skills.

Information Processing Model- a model for memory. Our senses are constantly being bombarded with information. Information is held in sensory memory for 1-4 seconds and then depending on what the individual pays attention to and their perception (the meaning attached) of the information it either goes into working memory or is forgotten. Information is held temporarily in working memory (about 20 seconds), students must focus on the information or it will be forgotten. Working memory has a limited capacity (5 bits for a kindergartener, possibly 7 bits for upper elementary). Information may move from working memory into long-term memory if it is connected to prior knowledge. Long-term memory holds information that is well learned. The

capacity to hold information in long-term memory is limitless and it can remain permanently. Elaboration (connecting to prior knowledge), organization, and context play a role in storing information. Retrieval (remembering) of information occurs in two ways: 1) spread of activation (associated information is triggered by the information focused on) or 2) reconstruction (problem solving, similar to cracking a crime). Difficulty remembering information is due to interference (old information interferes with new) and decay (not using information).

Development - orderly change over time, lasting growth, individuals develop at different rates, heredity and environment impact development

Cognitive development - gradual, orderly change in mental processes (thinking). During this time new abilities emerge and a better quality of processing information results. Language development and cognitive development are closely aligned.

Schemes - Groups of similar thoughts or actions, a network of information, patterns of thoughts for concepts or skills. Our schemes become more complex with experiences and development. Schema is created and modified through organization and adaptation. (My schema of an elementary student: young child, playing with friends at recess, reading Harry Potter, raising hand to speak, eating part of school lunch, giggling, ponytail)

Adaptation - adjust new information through assimilation and accommodation

Assimilation - fit new information into existing schema, new information makes sense with what the student has previously learned (child has a schema for car and calls a train and truck a car - any mode of transportation is a car)

Accommodation - modify schema or form a new schema in order to understand information (child differentiates between a car and train)

Organization - ordering and systematizing new information in order to understand it

Equilibration - you have an understanding of the environment and information, your current schema of concepts and skills is correct

Disequilibration - you don't understand your environment, situation, or problem, this motivates you to learn and revise your schema, students are uncomfortable until they understand the information and equilibration is achieved

Concrete-Operational Child (elementary age) exhibits the following characteristics:

Conservation - amount stays the same even if reshaped or rearranged

Decentration - can focus on more than 1 dimension or feature at a time (a cup has height and width)

Reversible thinking - some processes can be reversed (addition is the reverse of subtraction)

Serration - can arrange objects by height, weight, age ($A < B < C$ therefore $A < C$)

Transformation - change and its effects on something (tadpole becomes a frog)

Classify - the student is able to group objects into categories by looking at more than one characteristic

Zone of proximal development - level of potential development, where the child can't perform skills and understand information independently, but with the help of a more knowledgeable person can learn the information. Every student has many zones of proximal development

Private speech - children talk to themselves to guide their thinking, as we develop this becomes inner speech

Scaffolding - offering proper support for learning (tap into prior knowledge, cue, prompt, ½ done problems, break larger tasks into smaller tasks)

Assisted learning - an adult or more knowledgeable peer that helps a child in the learning process.