Chapter 8

Learning Theories

Current learning theories are based on cognitive psychology and constructivist education research. Familiarity with these theories is essential if librarians are to develop effective teaching techniques to guide learning (McGregor, as cited in Stripling, 1999). A librarian not only needs to be familiar with the information literacy components to facilitate, but must also demonstrate competence in facilitating knowledge (pedagogy) and be aware of students' individual learning differences.

There are many different theories on learning and within each one there are variations. There is no right or wrong theory, as not all education practices are based on a specific school of thought (Grassian and Kaplowitz, 2001). Librarians need to choose the theory and its variations that is compatible with their teaching style as well as the subject or topic to be taught. Keep in mind that:

- Learning involves change
- This change is fairly permanent
- Learning may involve a change in consciousness (how we think) or behaviour (what we do) or both
- Learning comes about through interaction with elements in our environment, such as, information, events and experiences (including but not limited to teaching and training) (Squires, 1994).

Here is a summary of the main learning theories, learning models and factors that influence learning in individuals and thinking and learning concepts (McGregor, as cited in Stripling, 1999). It needs to be emphasized that they are only a few of the many that exist.

Behaviorist view. Reality is external and absolute. It is measurable, and cause and effect can be determined and standardized; an application example is standardized testing. Some of the main concepts are:

- Conditioning (Pavlov, 2005) – Learning is interpreted according to observable behavior. What people do is what matters rather than what they think.

- Reinforcement (Skinner, 1986) – Stimulus is provided after an act is performed as a way to encourage or discourage repetition of a particular behavior.

- Observation learning (Bandura, 2004) – Learning occurs through watching and then imitating behavior.

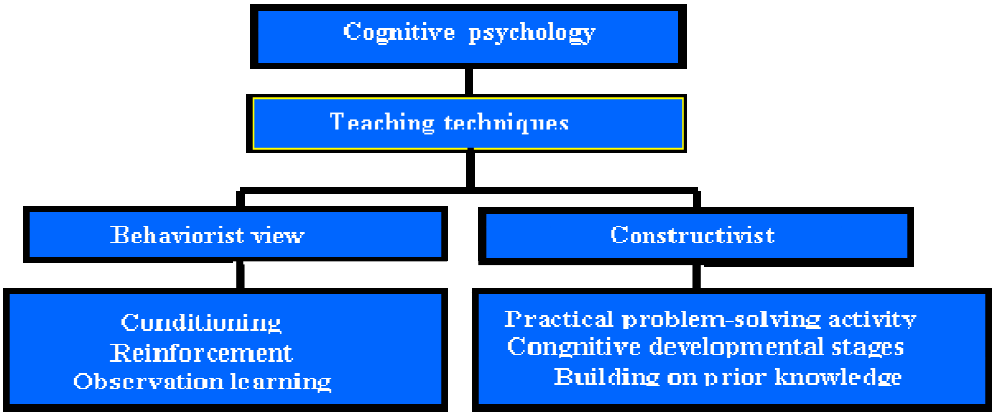
Constructivist approach. Reality is something that is socially constructed by individuals who determine their reality based on their unique prior knowledge and experiences. The theory differs from the behaviorist view in assuming that it is possible to examine what is not observable, attempting to understand what happens in the mind when we learn. Current thinking about learning is strongly influenced by constructivist theory and research. Some of the main constructivist education models are:

- Practical problem-solving activity (Dewey, 1967) – Learning can be achieved by reflective thinking to solve problems through analysis of lifelike problems and potential alternative solutions, i.e., teachers acting as guides rather than dispensers of information.

- Cognitive developmental stages (Piaget, 2005) – Children's learning development increases through previous understanding, even though the previous ideas might be inaccurate. He describes the four development stages children must move through. They cannot progress from one stage to the next until certain criteria have been met; recogniz*es* what children can do, rather that what they cannot do.

- Building on prior knowledge (Bruner, 1962) – Learners build on their prior knowledge to reach more advanced levels of understanding. Learning is an active process of discovery and categorization.

Figure 8. Learning Theories



Learning models (McGregor, 1999). In constructivist education models, the pedagogy of both learning and cognitive psychology rely on different learning models that are not necessarily exclusive of one another.

- Inquiry learning (Bruner, 1962). Teachers/faculty provides problems (with open, closed or active answers) for students to solve and the resources with which to solve them.

- Student-centered learning. Students are seen as individuals who should have a say in what they learn. Learning is active and learners are encouraged to be self-directed, taking responsibility for their own learning.

- Cooperative learning (Slavin, 1995) – Interaction among students promotes achievement of learning goals more successfully than learning alone.

- Brain-based learning. This learning style is based on five assumptions: 1) the brain operates by organizing input and making meaning of it. 2) The brain functions by searching patterns. 3) The brain can do more than one thing a time, and it process wholes and parts simultaneously. 4) Emotions play an important role in learning. 5) Each brain is individual and different from every other brain.

- Meaningful learning. Learners are engaged in meaningful, challenging tasks or in solving real-world problems. They construct their own understanding when they are interested in what they are learning, regulating, and controlling, when they set their own learning goals, are aware of and able to choose their own learning strategies, and are able to work with other students. This model involves many of those previous described.

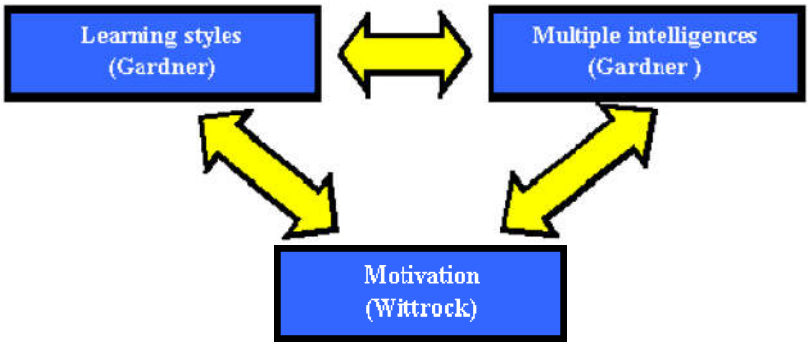
Factors in the learning process (McGregor, 1999). Learning is affected by different factors, including, multiple types of learners' intelligence, learning styles, and motivation.

- Multiple intelligences (Gardner, 1983) – Intelligence is a multifaceted concept and learners simultaneously have multiple ones or ways they analyze their worlds. They are: linguistic, logical-mathematical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, and naturalist.

- Learning styles (Gardner, 1983) – A learning style is a general preference whereas intelligence is a capacity for dealing with specific content. Some authors emphasize physical and environmental preferences, cognitive styles, and ways of working. There are various categorizations to assess personality types, sensory preferences (visual, auditory, kinesthetic), environmental preferences and thinking styles.

- Motivation (Wittrock, 2004) – The process of initiating, sustaining, and directing activity strongly influences how people learn. Motivational programs are based on behaviorist theory, i.e., providing extrinsic rewards to encourage students to learn. The drawback is that students tend to focus on the reward rather than on the learning activity itself.

Figure 9. Factors: Learning Process



Thinking and learning (McGregor, 1999). The way people think and the kinds of thinking they do is an important element to the process of learning.

- Bloom's Taxonomy (Bloom, 1956) – The taxonomy for classifying learning objectives in the cognitive domain lists thinking skills in a hierarchical order which suggests the skills teachers/faculty should promote. The skills, from the simplest to most complex, are: knowledge, comprehension, application, analysis, synthesis, and evaluation. Knowledge is referred as the simplest meaning unlike the definition in library science.

- Critical thinking (Ennis, 1985) – It is a "reasonable, reflective thinking that is focused on deciding what to believe or do." (pp. 54) Definitions include components of decision making and improvement of thinking.

- Creating thinking (Cave, 1996) – It is the ability to look at things in a different way from the obvious or the traditional. Creative thinking has two components, divergent and convergent thinking. The first is the intellectual ability to think about more than one thing at a time and elaborate ideas, and the second is the ability to evaluate logically, critique and choose the best idea from a selection of ideas.

- Metacognition (Blakey and Spence, 1990) – Thinking about thinking is regarded as metacognition, an important element of both critical and creative thinking. Learners who are aware of what and how they are thinking can improve their thinking. An example of this approach is asking students to reread and analyze thoughts they have recorded in journals.

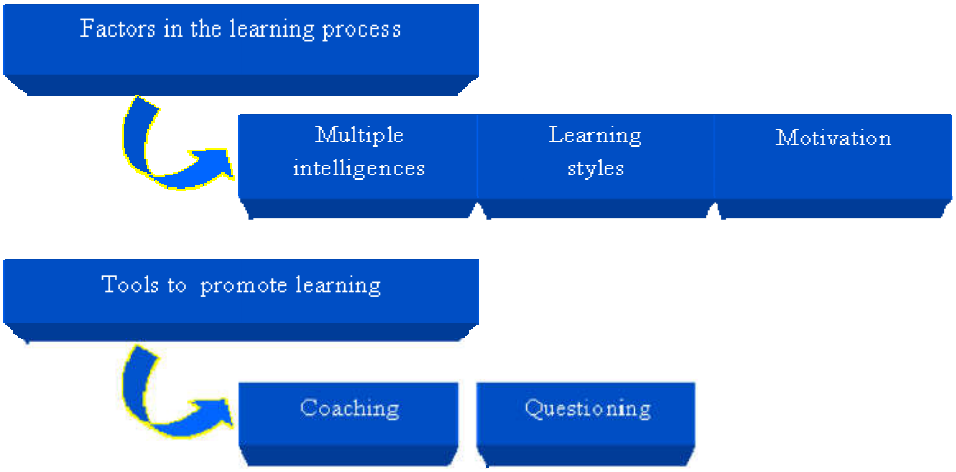
- Mental models (Glynn, 1997) – Mental models are the framework in constructing new understandings (supports Piaget's and Vygotsky's theories). Learners perceive concepts through mental representations that help them to understand. Mental models stress the importance of prior knowledge, as prior knowledge is held within mental models, and new learning is built on those models.

Tools to promote learning (McGregor, 1999). There are several techniques to encourage learning, including:

Coaching. The guidance (supportive, facilitative) of a student or students through a task or train of thought is a useful technique for teachers/faculty. This is the opposite of directing.

Questioning. A useful tool to access prior knowledge or extend thinking. It is meant to encourage divergent, higher order and critical thinking.

Figure 10. Learning Elements



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