Learning Theories in Plain English

eBook - Volume 1

Over 30 learning theories – presented in a way that you can understand!

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Self-Determination Theory (Deci and Ryan)

http://www.learning-theories.com/self-determination-theory-deci-and-ryan.html

Summary: Self-Determination Theory is a theory of motivation and personality that addresses three universal, innate and psychological needs: competence, autonomy, and psychological relatedness.

Originators: Edward L. Deci and Richard M. Ryan, psychologists at the University of Rochester.

Key Terms: motivation, competence, autonomy, relatedness

Self-Determination Theory (Deci and Ryan)

Self-Determination Theory (SDT) is an important theory of motivation that addresses issues of extrinsic and intrinsic motivation. People have innate psychological needs:

- Competence
- Relatedness
- Autonomy

If these universal needs are met, the theory argues that people will function and grow optimally. To actualize their inherent potential, the social environment needs to nurture these needs.

Competence
Seek to control the outcome and experience mastery.

Relatedness
Is the universal want to interact, be connected to, and experience caring for others.

Autonomy
Is the universal urge to be causal agents of one's own life and act in harmony with one's integrated self; however, Deci and Vansteenkiste note this does not mean to be independent of others

Motivation has often been grouped into two main types: *extrinsic* and *intrinsic*. With *extrinsic* motivation, a person tends to do a task or activity mainly because doing so will yield some kind of reward or benefit upon completion. *Intrinsic* motivation, in contrast, is characterized by doing something purely because of enjoyment or fun.

Deci, Lens and Vansteenkiste (2006) conducted a study that demonstrated intrinsic goal framing (compared to to extrinsic goal framing and no-goal framing) produced
deeper engagement in learning activities, better conceptual learning, and higher persistence at learning activities.

For more information, see:

- http://personalitypedagogy.arcadia.edu/pmwiki/pmwiki.php?n=Topics.Self-DeterminationTheory
- Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist, 41*, 19-31.

Operant Conditioning (Skinner)

http://www.learning-theories.com/operant-conditioning-skinner.html

Summary: A behaviorist theory based on the fundamental idea that behaviors that are reinforced will tend to continue, while behaviors that are punished will eventually end.

Originators and Key Contributors: B. F. Skinner, built upon Ivan Pavlov's theories of classical conditioning.

Keywords: response-stimulus, voluntary response, reinforcer

Operant Conditioning (B. F. Skinner)

Operant conditioning can be described as a process that attempts to modify behavior through the use of positive and negative reinforcement. Through operant conditioning, an individual makes an association between a particular behavior and a consequence.

- Example 1: Parents rewarding a child's excellent grades with candy or some other prize.
- Example 2: A schoolteacher awards points to those students who are the most calm and well-behaved. Students eventually realize that when they voluntarily become quieter and better behaved, that they earn more points.
- Example 3: A form of reinforcement (such as food) is given to an animal every time the animal (for example, a hungry lion) presses a lever.

The term "operant conditioning" originated by the behaviorist B. F. Skinner, who believed that one should focus on the external, observable causes of behavior (rather than try to unpack the internal thoughts and motivations)

Reinforcement comes in two forms: positive and negative.

Positive and negative reinforcers

- *Positive reinforcers* are favorable events or outcomes that are given to the individual after the desired behavior. This may come in the form of praise, rewards, etc.
- *Negative reinforcers* typically are characterized by the removal of an undesired or unpleasant outcome after the desired behavior. A response is strengthened as something considered negative is removed.

The goal in both of these cases of reinforcement is for the behavior to increase.

Positive and negative punishment

Punishment, in contrast, is when the increase of something undesirable attempts to cause a decrease in the behavior that follows.

- *Positive punishment* is when unfavorable events or outcomes are given in order to weaken the response that follows.
- *Negative punishment* is characterized by when an favorable event or outcome is removed after a undesired behavior occurs.

The goal in both of these cases of punishment is for a behavior to decrease.

What is the difference between operant conditioning and classical conditioning? In operant conditioning, a voluntary response is then followed by a reinforcing stimulus. In this way, the voluntary response (e.g. studying for an exam) is more likely to be done by the individual. In contrast, classical conditioning is when a stimulus automatically triggers an involuntary response.

For more information, see:

- http://psycnet.apa.org/psycinfo/1975-20047-000

Cognitive Apprenticeship (Collins et al.)

http://www.learning-theories.com/cognitive-apprenticeship-collins-et-al.html

Summary: Cognitive Apprenticeship is a theory that attempts to bring tacit processes out in the open. It assumes that people learn from one another, through observation, imitation and modeling.

Originator: Collins, Brown and Newman

Key Terms: Modeling, coaching, scaffolding, articulation, reflection

Cognitive Apprenticeship

Around 1987, Collins, Brown, and Newman developed six teaching methods -- modeling, coaching, scaffolding, articulation, reflection and exploration. These methods enable students to cognitive and metacognitive strategies for "using, managing, and discovering knowledge"

Modeling

Experts (usually teachers or mentors) demonstrate a task explicitly. New students or novices build a conceptual model of the task at hand. For example, a math teacher might write out explicit steps and work through a problem aloud, demonstrating her heuristics and procedural knowledge.

Coaching

During Coaching, the expert gives feedback and hints to the novice.

Scaffolding

Scaffolding the process of supporting students in their learning. Support structures are put into place. In some instances, the expert may have to help with aspects of the task that the student cannot do yet.

Articulation

McLellan describes articulation as (1) separating component knowledge and skills to learn them more effectively and, (2) more common verbalizing or demonstrating knowledge and thinking processes in order to expose and clarify them.

This process gets students to articulate their knowledge, reasoning, or problem-solving process in a domain" (p. 482). This may include inquiry teaching (Collins & Stevens, 1982), in which teachers ask students a series of questions that allows them to refine and restate their learned knowledge and to form explicit conceptual models. Thinking aloud requires students to articulate their thoughts while solving problems. Students assuming a critical role monitor others in cooperative activities and draw conclusions based on the problem-solving activities.

Reflection

Reflection allows students to "compare their own problem-solving processes with those of an expert, another student, and ultimately, an internal cognitive model of expertise" (p. 483). A technique for reflection could be to examine the past performances of both expert and novice and to highlight similarities and differences. The goal of reflection is for students to look back and analyze their performances with a desire for understanding and improvement towards the behavior of an expert.

Exploration

Exploration involves giving students room to problem solve on their own and teaching students exploration strategies. The former requires the teacher to slowly withdraw the use of supports and scaffolds not only in problem solving methods, but problem setting methods as well. The latter requires the teacher to show students how to explore, research, and develop hypotheses. Exploration allows the student to frame interesting problems within the domain for themselves and then take the initiative to solve these problems.

For more information, see:

- Collins, A., Brown, J. S., & Newman, S. E. (1987). Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics (Technical Report No. 403). BBN Laboratories, Cambridge, MA. Centre for the Study of Reading, University of Illinois. January, 1987.

Cognitive Load Theory of Multimedia Learning (Sweller)

http://www.learning-theories.com/cognitive-load-theory-of-multimedia-learning-sweller.html

Summary: A theory that focuses the load on working memory during instruction.

Originators and proponents: John Sweller

Keywords: cognitive load theory, working memory, multimedia learning

Cognitive Load Theory of Multimedia Learning (Sweller)

John Sweller's paper, "Implications of Cognitive Load Theory for Multimedia Learning" describes the human cognitive architecture, and the need to apply sound instructional design principles based on our knowledge of the brain and memory. Sweller first describes the different types of memory, and how both are interrelated, because schemas held in long-term memory, acting as a "central executive", directly affect the manner in which information is synthesized in working memory. Sweller then explains that in the absence of schemas, instructional guidance must provide a substitute for learners to develop either own schemas.

Sweller discusses, in his view, three types of cognitive load:

- extraneous cognitive load
- intrinsic cognitive load
- germane cognitive load

Intrinsic cognitive load

First described by Chandler and Sweller, intrinsic cognitive load is the idea that all instruction has an inherent difficulty associated with it (for instance, calculating 5+5). This inherent difficulty may not be altered by an instructor. However many schemas may be broken into individual "subschemas" and taught in isolation, to be later brought back together and described as a combined whole.

Extraneous cognitive load

Extraneous cognitive load, by contrast, is under the control of instructional designers. This form of cognitive load is generated by the manner in which information is presented to learners (i.e., the design). To illustrate an example of extraneous cognitive load, assume there are at least two possible ways to describe a geometric shape like a triangle. An instructor could describe a triangle in a verbally, but to show a diagram of a triangle is much better because the learner does not have to deal with extraneous, unnecessary information.

Germane cognitive load

Germane load is a third kind of cognitive load which is encouraged to be promoted. Germane load is the load dedicated to the processing, construction and automation of schemas. While intrinsic load is generally thought to be immutable, instructional designers can manipulate extraneous and germane load. It is suggested that they limit extraneous load and promote germane load.

Extraneous cognitive load and intrinsic cognitive load are not ideal; they result from inappropriate instructional designs and complexity of information. Germane cognitive load is coined as “effective’ cognitive load, caused by successful schema construction. Each of the cognitive loads are additive, and instructional design’s goal should be to reduce extraneous cognitive load to free up working memory. Throughout the article, Sweller also draws interesting comparisons between human cognition and evolutionary theory.

For more information, see:

Sweller, J. (1988). "Cognitive load during problem solving: Effects on learning". *Cognitive Science* **12** (2): 257–285.

Sweller, J., Van Merriënboer, J., & Paas, F. (1998). "Cognitive architecture and instructional design". *Educational Psychology Review* **10**: 251–296.

Cognitive Theory of Multimedia Learning (Mayer)

http://www.learning-theories.com/cognitive-theory-of-multimedia-learning-mayer.html

Summary: A cognitive theory of multimedia learning based on three main assumptions: there are two separate channels (auditory and visual) for processing information; there is limited channel capacity; and that learning is an active process of filtering, selecting, organizing, and integrating information.

Originator: Richard Mayer

Key terms: dual-channel, limited capacity, sensory, working, long-term memory

Cognitive Theory of Multimedia Learning (Mayer)

The principle known as the "multimedia principle" states that "people learn more deeply from words and pictures than from words alone" (Mayer, p. 47). However, simply adding words to pictures is not an effective way to achieve multimedia learning. The goal is to instructional media in the light of how human mind works. This is the basis for Mayer's cognitive theory of multimedia learning. This theory proposes three main assumptions when it comes to learning with multimedia:

1. There are two separate channels (auditory and visual) for processing information (sometimes referred to as Dual-Coding theory);
2. Each channel has a limited (finite) capacity (similar to Sweller's notion of Cognitive Load);
3. Learning is an active process of filtering, selecting, organizing, and integrating information based upon prior knowledge.

Humans can only process a finite amount of information in a channel at a time, and they make sense of incoming information by actively creating mental representations. Mayer also discusses the role of three memory stores: sensory (which receives stimuli and stores it for a very short time), working (where we actively process information to create mental constructs (or 'schema'), and long-term (the repository of all things learned). Mayer's cognitive theory of multimedia learning presents the idea that the brain does not interpret a multimedia presentation of words, pictures, and auditory information in a mutually exclusive fashion; rather, these elements are selected and organized dynamically to produce logical mental constructs. Futhermore, Mayer underscores the importance of learning (based upon the testing of content and demonstrating the successful transfer of knowledge) when new information is integrated with prior knowledge.

Design principles including providing coherent verbal, pictorial information, guiding the learners to select relevant words and images, and reducing the load for a single processing channel etc. can be entailed from this theory.

References:

Mayer, R. E.; R. Moreno (1998). "A Cognitive Theory of Multimedia Learning: Implications for Design

Principles". http://www.unm.edu/~moreno/PDFS/chi.pdf.
Moreno, R., & Mayer, R. (1999). "Cognitive principles of multimedia learning: The role of modality and contiguity". Journal of Educational Psychology 91: 358–368.
Mayer, R. E. (2001). Multimedia learning. New York: Cambridge University Press.

Self-Theories (Dweck)

http://www.learning-theories.com/self-theories-dweck.html

Summary: Carol Dweck and others have Identified two implicit theories of intelligence. Those learners who have an "entity" theory view intelligence as being an unchangeable, fixed internal characteristic. Those who have an "incremental" theory believe that their intelligence is malleable and can be increased through effort.

Originators: Carol Dweck, based on over 30 years of research on belief systems, and their role in motivation and achievement. Discussed in her book Self-Theories: Their Role in Motivation, Personality, and Development (1999).

Key Terms: entity theory, incremental theory

Self-Theories (Dweck)

Carol Dweck (currently at Indiana University) describes a series of empirically-based studies that investigate how people develop beliefs about themselves (i.e., self-theories) and how these self-theories create their psychological worlds, shaping thoughts, feelings and behaviors. The theories reveal why some students are motivated to work harder, and why others fall into patterns of helplessness and are self-defeating. Dweck's conclusions explore the implications for the concept of self-esteem, suggesting a rethinking of its role in motivation, and the conditions that foster it. She demonstrated empirically that students who hold an entity theory of intelligence are less likely to attempt challenging tasks and are at risk for academic underachievement.

Students carry two types of views on ability/intelligence:

1. **Entity View** - This view (those who are called "Entity theorists") treats intelligence as fixed and stable. These students have a high desire to prove themselves to others; to be seen as smart and avoid looking unintelligent.
2. **Incremental View** - This view treats intelligence as malleable, fluid, and changeable. These students see satisfaction coming from the process of learning and often see opportunities to get better. They do not focus on what the outcome will say about them, but what they can attain from taking part in the venture.

Entity theorists are susceptible to learned helplessness because they may feel that circumstances are outside their control (i.e. there's nothing that could have been done to make things better), thus they may give up easily. As a result, they may simply avoid situations or activites that they perceive to be challenging (perhaps through procrastination, absenteeism, etc.). Alternatively, they may purposely choose extremely difficult tasks so that they have an excuse for failure. Ultimately, they may stop trying altogether. Because success (or failure) is often linked to what is perceived as a fixed amount of intelligence rather than effort (e.g., the belief that "I did poorly because I'm not a smart person"), students may think that failure implies a natural lack of intelligence. Dweck found that students with a long history of success may be the most vulnerable for developing learned helplessness because they may buy

into the entity view of intelligence more readily than those with less frequent success (Dweck, 1999).

Those with an incremental view ("Incremental theorists") when faced with failure, react differently: these students desire to master challenges, and therefore adopt a mastery-oriented pattern. They immediately began to consider various ways that they could approach the task differently, and they increase their efforts. Unlike Entity theorists, Incremental theorists believe that effort, through increased learning and strategy development, will actually increase their intelligence.

For more information, see:

- Dweck, C. S. (1999). Self-Theories: Their role in motivation, personality, and development. Philadelphia, PA: The Psychology Press.

Classical Conditioning (Pavlov)

http://www.learning-theories.com/classical-conditioning-pavlov.html

Summary: Classical conditioning is a reflexive or automatic type of learning in which a stimulus acquires the capacity to evoke a response that was originally evoked by another stimulus.

Originators and Key Contributors: First described by Ivan Pavlov (1849-1936), Russian physiologist, in 1903, and studied in infants by John B. Watson (1878-1958).

Keywords: stimulus-response, psychic reflexes, unconditioned stimulus, conditioned response, respondent conditioning

Classical Conditioning (Ivan Pavlov)

Several types of learning exist. The most basic form is *associative learning*, i.e., making a new association between events in the environment. There are two forms of associative learning: classical conditioning (made famous by Ivan Pavlov's experiments with dogs) and operant conditioning.

Pavlov's Dogs

In the early twentieth century, Russian physiologist Ivan Pavlov did Nobel prize-winning work on digestion. While studying the role of saliva in dogs' digestive processes, he stumbled upon a phenomenon he labeled "psychic reflexes." While an accidental discovery, he had the foresight to see the importance of it. Pavlov's dogs, restrained in an experimental chamber, were presented with meat powder and they had their saliva collected via a surgically implanted tube in their saliva glands. Over time, he noticed that his dogs who begin salivation before the meat powder was even presented, whether it was by the presence of the handler or merely by a clicking noise produced by the device that distributed the meat powder.

Fascinated by this finding, Pavlov paired the meat powder with various stimuli such as the ringing of a bell. After the meat powder and bell (auditory stimulus) were presented together several times, the bell was used alone. Pavlov's dogs, as predicted, responded by salivating to the sound of the bell (without the food). The bell began as a neutral stimulus (i.e. the bell itself did not produce the dogs' salivation). However, by pairing the bell with the stimulus that did produce the salivation response, the bell was able to acquire the ability to trigger the salivation response. Pavlov therefore demonstrated how stimulus-response bonds (which some consider as the basic building blocks of learning) are formed. He dedicated much of the rest of his career further exploring this finding.

In technical terms, the meat powder is considered an unconditioned stimulus (UCS) and the dog's salivation is the unconditioned response (UCR). The bell is a neutral stimulus until the dog learns to associate the bell with food. Then the bell becomes a conditioned stimulus (CS) which produces the conditioned response (CR) of salivation after repeated pairings between the bell and food.

John B. Watson: Early Classical Conditioning with Humans

John B. Watson further extended Pavlov's work and applied it to human beings. In 1921, Watson studied Albert, an 11 month old infant child. The goal of the study was to condition Albert to become afraid of a white rat by pairing the white rat with a very loud, jarring noise (UCS). At first, Albert showed no sign of fear when he was presented with rats, but once the rat was repeatedly paired with the loud noise (UCS), Albert developed a fear of rats. It could be said that the loud noise (UCS) induced fear (UCR). The implications of Watson's experiment suggested that classical conditioning could cause some phobias in humans.

For more information, see:

- Pavlov, I. P. (1927). *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex. Translated and Edited by G. V. Anrep*. London: Oxford University Press. Full text available online

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Humanism

http://www.learning-theories.com/humanism.html

Summary: Humanism is a paradigm/philosophy/pedagogical approach that believes learning is viewed as a personal act to fulfil one's potential.

Key proponents: Abraham Maslow, Carl Rogers, Malcolm Knowles

Key terms: self-actualization, teacher as facilitator, affect

Humanism

Humanism, a paradigm that emerged in the 1960s, focuses on the human freedom, dignity, and potential. A central assumption of humanism, according to Huitt (2001), is that people act with intentionality and values. This is in contrast to the behaviorist notion of operant conditioning (which argues that all behavior is the result of the application of consequences) and the cognitive psychologist belief that the discovering knowledge or constructing meaning is central to learning. Humanists also believe that it is necessary to study the person as a whole, especially as an individual grows and develops over the lifespan. It follows that the study of the self, motivation, and goals are areas of particular interest.

Key proponents of humanism include Carl Rogers and Abraham Maslow. A primary purpose of humanism could be described as the development of self-actualized, automomous people. In humanism, learning is student centered and personalized, and the educator's role is that of a facilitator. Affective and cognitive needs are key, and the goal is to develop self-actualized people in a cooperative, supportive environment.

Related theories include: Experiential Learning (Kolb), Maslow's Hierarchy of Needs, and Facilitation Theory (Rogers).

For more information, see:

- DeCarvalho, R. (1991). The humanistic paradigm in education. *The Humanistic Psychologist, 19*(1), 88-104.
- Huitt, W. (2001). Humanism and open education. *Educational Psychology Interactive*. Valdosta, GA: Valdosta State University. Retrieved September 11, 2007, from the URL: http://chiron.valdosta.edu/whuitt/col/affsys/humed.html.
- Rogers, C., & Freiberg, H. J. (1994). *Freedom to learn* (3rd Ed.). New York: Macmillan.

Social Development Theory (Vygotsky)

http://www.learning-theories.com/vygotskys-social-learning-theory.html

Summary: Social Development Theory argues that social interaction precedes development; consciousness and cognition are the end product of socialization and social behavior.

Originator: Lev Vygotsky (1896-1934).

Key terms: Zone of Proximal Development (ZPD), More Knowledgeable Other (MKO)

Vygotsky's Social Development Theory

Vygotsky's Social Development Theory is the work of Russian psychologist Lev Vygotsky (1896-1934), who lived during Russian Revolution. Vygotsky's work was largely unkown to the West until it was published in 1962.

Vygotsky's theory is one of the foundations of constructivism. It asserts three major themes:

Major themes:

1. Social interaction plays a fundamental role in the process of cognitive development. In contrast to Jean Piaget's understanding of child development (in which development necessarily precedes learning), Vygotsky felt social learning precedes development. He states: "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological)." (Vygotsky, 1978).
2. The More Knowledgeable Other (MKO). The MKO refers to anyone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept. The MKO is normally thought of as being a teacher, coach, or older adult, but the MKO could also be peers, a younger person, or even computers.
3. The Zone of Proximal Development (ZPD). The ZPD is the distance between a student's ability to perform a task under adult guidance and/or with peer collaboration and the student's ability solving the problem independently. According to Vygotsky, learning occurred in this zone.

Vygotsky focused on the connections between people and the sociocultural context in which they act and interact in shared experiences (Crawford, 1996). According to Vygotsky, humans use tools that develop from a culture, such as speech and writing, to mediate their social environments. Initially children develop these tools to serve solely as social functions, ways to communicate needs. Vygotsky believed that the internalization of these tools led to higher thinking skills.

Applications of the Vygotsky's Social Development Theory

Many schools have traditionally held a transmissionist or instructionist model in which a teacher or lecturer 'transmits' information to students. In contrast, Vygotsky's theory promotes learning contexts in

which students play an active role in learning. Roles of the teacher and student are therefore shifted, as a teacher should collaborate with his or her students in order to help facilitate meaning construction in students. Learning therefore becomes a reciprocal experience for the students and teacher.

For more information, see:

- Driscoll, M. P. (1994). Psychology of Learning for Instruction. Needham, MA: Allyn & Bacon.
- Crawford, K. (1996) Vygotskian approaches to human development in the information era. Educational Studies in Mathematics. (31) 43-62.
- Vygotsky, L.S. (1978). Mind and society: The development of higher mental processes. Cambridge, MA: Harvard University Press.
- Wertsch, James V. Sohmer, Richard. (1995). Vygotsky on learning and development. Human Development. (38) 332-37.

Maslow's Hierarchy of Needs

http://www.learning-theories.com/maslows-hierarchy-of-needs.html

Summary: Maslow's Hierarchy of Needs (often represented as a pyramid with five levels of needs) is a motivational theory in psychology that argues that while people aim to meet basic needs, they seek to meet successively higher needs in the form of a hierarchy.

Originator: Abraham Maslow in 1943.

Key terms: deficiency needs, growth needs, physiological, safety, belongingness, esteem, self-actualization

Maslow's Hierarchy of Needs

Abraham H. Maslow felt as though conditioning theories did not adequately acapture the complexity of human behavior. In a 1943 paper called *A Theory of Human Motivation*, Maslow presented the idea that human actions are directed toward goal attainment. Any given behavior could satisfy several functions at the same time; for instance, going to a pub could satisfy one's needs for self-esteem and for social interaction.

Maslow's Hierarchy of Needs has often been represented in a hierarchial pyramid with five levels. The four levels (lower-order needs) are considered *physiological needs*, while the top level is considered *growth needs*. The lower level needs need to be satisfied before higher-order needs can influence behavior. The levels are as follows (see pyramid in Figure 1 below).

- **Self-actualization** - morality, creativity, problem solving, etc.
- **Esteem** - includes confidence, self-esteem, achievement, respect, etc.
- **Belongingness** - includes love, friendship, intimacy, family, etc.
- **Safety** - includes security of environment, employment, resources, health, property, etc.
- **Physiological** - includes air, food, water, sex, sleep, other factors towards homeostasis, etc.

Figure 1. Maslow's Hierarchy of Needs Pyramid.

Deprivation Needs

The first four levels are considered *deficiency* or *deprivation needs* ("D-needs") in that their lack of satisfaction causes a deficiency that motivates people to meet these needs. *Physiological needs*, the lowest level on the hierarchy, include necessities such as air, food, and water. These tend to be satisfied for most people, but they become predominant when unmet. During emergencies, *safety needs* such as health and security rise to the forefront. Once these two levels are met, *belongingness needs*, such as obtaining love and intimate relationships or close friendships, become important. The next level, *esteem needs*, include the need for recognition from others, confidence, achievement, and self-esteem.

Growth Needs

The highest level is *self-actualization*, or the self-fulfillment. Behavior in this case is not driven or motivated by deficiencies but rather one's desire for personal growth and the need to become all the things that a person is capable of becoming (Maslow, 1970).

Criticisms

While a useful guide for generally understanding why students behave the way that they do and in determining how learning may be affected by physiological or safety deficiencies, Maslow's theory has its share of criticisms. Some have noted vagueness in what is a "deficiency"; what is a deficiency for one is not necessarily a deficiency for another. Secondly, there seem to be various exceptions that frequently occur. For example, some people often risk their own safety to rescue others from danger.

For more information, see:

- Maslow, A. H. (1943). A Theory of Human Motivation. Psychological Review, 50, pp. 370. Link to Full Text.
- Maslow, A. H. (1970). Motivation and Personality, 2nd. Ed., New York, Harper & Row. ISBN 0060419873.
- Maslow's Hierarchy of Needs at the University of Hawaii.
- Maslow's Hierarchy of Needs at Deeper Mind.

Identity Status Theory (Marcia)

http://www.learning-theories.com/identity-status-theory-marcia.html

Summary: Refining and extending Erik Erikson's work, James Marcia came up with four Identity Statuses of psychological identity development. The main idea is that one's sense of identity is determined largely by the choices and commitments made regarding certain personal and social traits.

Originators: James Marcia, Canadian developmental psychologist and Emeritus Professor of Psychology at Simon Fraser University.

Key terms: identity status, diffusion, foreclosure, moratorium, achievement.

Marcia's Identity Statuses

Based on Erik Erikson's groundbreaking work on identity and psychosocial development in the 1960s, Canadian developmental psychologist James Marcia refined and extended Erikson's model, primarily focusing on adolescent development. Addressing Erikson's notion of identity crisis, Marcia posited that the adolescent stage consists neither of identity resolution nor identity confusion, but rather the degree to which one has explored and committed to an identity in a variety of life domains from vocation, religion, relational choices, gender roles, and so on. Marcia's theory of identity achievement argues that two distinct parts form an adolescent's identity: crisis (i. e. a time when one's values and choices are being reevaluated) and commitment. He defined a crisis as a time of upheaval where old values or choices are being reexamined. The end outcome of a crisis leads to a commitment made to a certain role or value.

Upon developing a semi-structured interview for identity research, Marcia proposed Identity Status of psychological identity development:

- **Identity Diffusion** - the status in which the adolescent does no have a sense of having choices; he or she has not yet made (nor is attempting/willing to make) a commitment
- **Identity Foreclosure** - the status in which the adolescent seems willing to commit to some relevant roles, values, or gaols for the future. Adolescents in this stage have not experienced an identity crisis. They tend to conform to the expectations of others regarding their future (e. g. allowing a parent to determine a career direction) As such, these individuals have not explored a range of options.
- **Identity Moratorium** - the status in which the adolescent is currently in a crisis, exploring various commitments and is ready to make choices, but has not made a commitment to these choices yet.
- **Identity Achievement** - the status in which adolescent has gone through a identity crisis and has made a commitment to a sense of identity (i.e. certain role or value) that he or she has chosen

Note that the above status are *not* stages and should not viewed as a sequential process.

The core idea is that one's sense of identity is determined largely by the choices and commitments made regarding certain personal and social traits. The work done in this paradigm considers how much one has made certain choices, and how much he or she displays a commitment to those choices. Identity involves the adoption of 1) a sexual orientation, 2) a set of values and ideals and 3) a vocational direction. A

well-developed identity gives on a sense of one's strengths, weaknesses, and individual uniqueness. A person with a less well-developed identity is not able to define his or her personal strengths and weaknesses, and does not have a well articulated sense of self.

To better understand the identity formation process, Marcia conducted interviews with young people. He asked whether the participants in his study (1) had established a commitment to an occupation and ideology and (2) had experienced, or were presently experiencing, a decision making period (adolescent identity crisis). Marcia developed a framework for thinking about identity in terms of four identity statuses.

For more information, see:

- Marcia, J. E., (1966), Development and validation of ego identity status, Journal of Personality and Social Psychology 3, pp. 551-558.

Communities of Practice (Lave and Wenger)

http://www.learning-theories.com/communities-of-practice-lave-and-wenger.html

Summary: Etienne Wenger summarizes Communities of Practice (CoP) as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly." This learning that takes place is not necessarily intentional. Three components are required in order to be a CoP: (1) the domain, (2) the community, and (3) the practice.

Originators: Jean Lave and Etienne Wenger in 1991 and further elaborated in 1998.

Key Terms: domain, community, practice, identity, learning

Communities of Practice

The term was first used in 1991 by theorists Jean Lave and Etienne Wenger who discussed the notion of legitimate peripheral participation. In 1998, the theorist Etienne Wenger extended the concept and applied it to other domains, such as organizations. With the flourishing of online communities on the Internet, as well as the increasing need for improved knowledge management, there has been much more interest as of late in communities of practice. People see them as ways of promoting innovation, developing social capital, facilitating and spreading knowledge within a group, spreading existing tacit knowledge, etc.

Communities of Practice can be defined, in part, as a process of social learning that occurs when people who have a common interest in a subject or area collaborate over an extended period of time, sharing ideas and strategies, determine solutions, and build innovations. Wenger gives a simple definition: "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly." Note that this allows for, but does not require intentionality. Learning can be, and often is, an incidental outcome that accompanies these social processes.

One needs to distinguish between what is a CoP and what is not. There are three required components of CoPs:

1. There needs to be *a domain*. A CoP has an identity defined by a shared domain of interest (e.g. radiologists, Star Trek fans, middle school history teachers, Seahawks football fans, etc.); it's not just a network of people or club of friends. Membership implies a commitment to the domain.
2. There needs to be a *community*. A necessary component is that members of a specific domain interact and engage in shared activities, help each other, and share information with each other. They build relationships that enable them to learn from each other. In this way, merely sharing the same job does not necessitate a CoP. A static website on hunting in itself is not a community of practice. There needs to be people who interact and learn together in order for a CoP to be formed. Note that members do not necessarily work together daily, however. Wenger points to the example of Impressionist painters who sometimes met in cafes to discuss their painting styles. He indicates that even though these men normally painted alone, these kinds of interactions were essential to making them a CoP.

3. There needs to be a *practice*: A CoP is not just people who have an interest in something (e.g. sports or agriculture practices). The third requirement for a CoP is that the members are *practitioners*. They develop a shared repertoire of resources which can include stories, helpful tools, experiences, stories, ways of handling typical problems, etc. This kind of interaction needs to be developed over time. A conversation with a random stranger who happens to be an expert on a subject matter that interests you does not in itself make a CoP. Informal conversations held by people of the same profession (e.g. office assistants or graduate students) help people share and develop a set of cases and stories that can become a shared repertoire for their practice, whether they realize it or not.

Communities develop their practice through a variety of methods, including: problem solving, requests for information, seeking the experiences of others, reusing assets, coordination and synergy, discussing developments, visiting other members, mapping knowledge and identifying gaps.

For Etienne Wenger, learning is central to human identity. A primary focus is learning as *social participation* – that is, an individual as an active participant in the practices of social communities, and in the construction of his or her identity through these communities. People continuously create their shared identity through engaging in and contributing to the practices of their communities. The motivation to become a more central participant in a community of practice can provide a powerful incentive for learning. Students will have a desire to develop skills (e.g. literacy skills) if the people they admire have the same skills. That is, they want to join the “literacy club” and will work towards becoming a a member.

For more information, see:

- Etienne Wenger's introduction to Communities of Practice.
- Lave, J., & Wenger, E. (1998). Communities of Practice: Learning, Meaning, and Identity: Cambridge University Press.

Erikson's Stages of Development

http://www.learning-theories.com/eriksons-stages-of-development.html

Summary: An eight stage theory of identity and psychosocial development

Erik Erikson (1902 -1994), a German-born American psychoanalyst.

Key Terms: Erikson's stages, psychosocial, development

Erikson's Stages of Development

Erik Erikson, a German psychoanalyst heavily influenced by Sigmund Freud, explored three aspects of identity: the *ego identity* (self), *personal identity* (the personal idiosyncrasies that distinguish a person from another, social/cultural identity (the collection of social roles a person might play).

Erikson's psychosocial theory of development considers the impact of external factors, parents and society on personality development from childhood to adulthood. According to Erikson's theory, every person must pass through a series of eight interrelated stages over the entire life cycle.

1. Infant (*Hope*) - Basic Trust vs. Mistrust
2. Toddler *(Will*) - Autonomy vs. Shame
3. Preschooler (*Purpose*) - Initiative vs. Guilt
4. School-Age Child (*Competence*) - Industry vs. Inferiority
5. Adolescent (*Fidelity*) - Identity vs. Identity Diffusion
6. Young Adult (*Love*) - Intimacy vs. Isolation
7. Middle-aged Adult (*Care*) - Generativity vs. Self-absorption
8. Older Adult (*Wisdom*) - Integrity vs. Despair

These eight stages, spanning from birth to death, are split in general age ranges.

1. Infancy: Birth-18 Months Old

Basic Trust vs. Mistrust - Hope

During the first or second year of life, the major emphasis is on the mother and father's nurturing ability and care for a child, especially in terms of visual contact and touch. The child will develop optimism, trust, confidence, and security if properly cared for and handled. If a child does not experience trust, he or she may develop insecurity, worthlessness, and general mistrust to the world.

2. Toddler / Early Childhood Years: 18 Months to 3 Years

Autonomy vs. Shame - Will

The second stage occurs between 18 months and 3 years. At this point, the child has an opportunity to

build self-esteem and autonomy as he or she learns new skills and right from wrong. The well-cared for child is sure of himself, carrying himself or herself with pride rather than shame. During this time of the "terrible twos", defiance, temper tantrums, and stubbornness can also appear. Children tend to be vulnerable during this stage, sometimes feeling shame and and low self-esteem during an inability to learn certain skills.

3. Preschooler: 3 to 5 Years

Initiative vs. Guilt - Purpose

During this period we experience a desire to copy the adults around us and take initiative in creating play situations. We make up stories with Barbie's and Ken's, toy phones and miniature cars, playing out roles in a trial universe, experimenting with the blueprint for what we believe it means to be an adult. We also begin to use that wonderful word for exploring the world—"WHY?"

While Erikson was influenced by Freud, he downplays biological sexuality in favor of the psychosocial features of conflict between child and parents. Nevertheless, he said that at this stage we usually become involved in the classic "Oedipal struggle" and resolve this struggle through "social role identification." If we're frustrated over natural desires and goals, we may easily experience guilt.

The most significant relationship is with the basic family.

4. School Age Child: 6 to 12 Years

Industry vs. Inferiority - Competence

During this stage, often called the Latency, we are capable of learning, creating and accomplishing numerous new skills and knowledge, thus developing a sense of industry. This is also a very social stage of development and if we experience unresolved feelings of inadequacy and inferiority among our peers, we can have serious problems in terms of competence and self-esteem.

As the world expands a bit, our most significant relationship is with the school and neighborhood. Parents are no longer the complete authorities they once were, although they are still important.

5. Adolescent: 12 to 18 Years

Identity vs. Role Confusion - Fidelity

Up until this fifth stage, development depends on what is done to a person. At this point, development now depends primarily upon what a person does. An adolescent must struggle to discover and find his or her own identity, while negotiating and struggling with social interactions and "fitting in", and developing a sense of morality and right from wrong.

Some attempt to delay entrance to adulthood and withdraw from responsibilities (moratorium). Those unsuccessful with this stage tend to experience role confusion and upheaval. Adolescents begin to develop a strong affiliation and devotion to ideals, causes, and friends.

6. Young adult: 18 to 35

Intimacy and Solidarity vs. Isolation - Love

At the young adult stage, people tend to seek companions hip and love. Some also begin to "settle down" and start families, although seems to have been pushed back farther in recent years.

Young adults seek deep intimacy and satisfying relationships, but if unsuccessful, isolation may occur. Significant relationships at this stage are with marital partners and friends.

7. Middle-aged Adult: 35 to 55 or 65

Generativity vs. Self absorption or Stagnation - Care

Career and work are the most important things at this stage, along with family. Middle adulthood is also the time when people can take on greater responsibilities and control.

For this stage, working to establish stability and Erikson's idea of *generativity* - attempting to produce something that makes a difference to society. Inactivity and meaninglessness are common fears during this stage.

Major life shifts can occur during this stage. For example, children leave the household, careers can change, and so on. Some may struggle with finding purpose. Significant relationships are those within the family, workplace, local church and other communities.

8. Late Adult: 55 or 65 to Death

Integrity vs. Despair - Wisdom

Erikson believed that much of life is preparing for the middle adulthood stage and the last stage involves much reflection. As older adults, some can look back with a feeling of *integrity* -- that is, contentment and fulfillment, having led a meaningful life and valuable contribution to society. Others may have a sense of despair during this stage, reflecting upon their experiences and failures. They may fear death as they struggle to find a purpose to their lives, wondering "What was the point of life? Was it worth it?"

For more information, see:

- Erikson, E. H. (1968). Identity: Youth and crisis. New York: Norton.

Cognitivism

http://www.learning-theories.com/cognitivism.html

Summary: The cognitivist paradigm essentially argues that the “black box” of the mind should be opened and understood. The learner is viewed as an information processor (like a computer).

Originators and important contributors: Merrill -Component Display Theory (CDT), Reigeluth (Elaboration Theory), Gagne, Briggs, Wager, Bruner (moving toward cognitive constructivism), Schank (scripts), Scandura (structural learning)

Keywords: Schema, schemata, information processing, symbol manipulation, information mapping, mental models

Cognitivism

The cognitivist revolution replaced behaviorism in 1960s as the dominant paradigm. Cognitivism focuses on the inner mental activities – opening the “black box” of the human mind is valuable and necessary for understanding how people learn. Mental processes such as thinking, memory, knowing, and problem-solving need to be explored. Knowledge can be seen as schema or symbolic mental constructions. Learning is defined as change in a learner’s schemata.

A response to behaviorism, people are not “programmed animals” that merely respond to environmental stimuli; people are rational beings that require active participation in order to learn, and whose actions are a consequence of thinking. Changes in behavior are observed, but only as an indication of what is occurring in the learner’s head. Cognitivism uses the metaphor of the mind as computer: information comes in, is being processed, and leads to certain outcomes.

Actor-Network Theory (ANT)

http://www.learning-theories.com/actor-network-theory-ant.html

Summary: Actor-Network Theory is a framework and systematic way to consider the infrastructure surrounding technological achievements. Assigns agency to both human and non-human actors (e.g. artifacts)

Originator: Michel Callon (1991) and Bruno Latour (1992); John Law; others.

Key Terms: actor, network, generalized symmetry, equal agency

Actor-Network Theory (ANT)

Originally created by French scholars Latour and Callon as an attempt to understand processes of technological innovation and scientific knowledge-creation, Actor-Network Theory (ANT) can be contrasted with "heroic" accounts of scientific advance. For example, rather than saying Newton "founded" the theory of gravitation seemingly as though he were alone in a vacuum, Actor-Network Theory emphasizes and considers all surrounding factors -- no one acts alone. Galileo's past experiences, his colleagues, his connections with the Astronomer Royal, John Flamsteed, his use of Euclidean geometry, Kepler's astronomy, Galileo's mechanics, his tools, the details of his lab, cultural factors and restrictions placed upon him in his environment, and various other technical and non-technical elements would all be described and considered in his actor-network.

Actor-Network Theory does not typically attempt to explain why a network exists; it is more interested in the infrastructure of actor-networks, how they are formed, how they can fall apart, etc.

Actor-Network Theory incorporates what is known as a *principle of generalized symmetry*; that is, what is human and non-human (e.g. artifacts, organization structures) should be integrated into the same conceptual framework and assigned equal amounts of agency. In this way, one gains a detailed description of the concrete mechanisms at work that hold the network together, while allowing an impartial treatment of the actors.

Criticism

There are various criticisms held regarding ANT. These include: (1) the absurdity of assigning agency to nonhuman actors; (2) that ANT is amoral; (3) that because it assumes all actors are equal within the network, no accomodations for power imbalances can be made; and (4) that ANT leads to useless descriptions that seem pointless.

For more information, see:

- Callon, M. (1986). Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. In John Law (ed.), Power, Action and Belief: A New Sociology of Knowledge. London: Routledge & Kegan Paul.

- Latour, B. (1987). Science in Action: How to Follow Scientists and Engineers Through Society (Milton Keynes: Open University Press).
- Latour, B. (2005). Reassembling the Social: An Introduction to Actor-Network-Theory (Oxford: Oxford University Press).
- Law, J. (1987). Technology and Heterogeneous Engineering: The Case of Portuguese Expansion. In W.E. Bijker, T.P. Hughes, and T.J. Pinch (eds.), The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology. Cambridge, MA: MIT Press.
- Actor-Network Theory entry on Wikipedia
- Bruno Latour discusses common misunderstandings related to Actor-Network Theory

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Elaboration Theory (Reigeluth)

http://www.learning-theories.com/elaboration-theory-reigeluth.html

Summary: Elaboration theory is an instructional design theory that argues that content to be learned should be organized from simple to complex order, while providing a meaningful context in which subsequent ideas can be integrated.

Originators: Charles Reigeluth (Indiana University) and his colleagues in the late 1970s.

Key Terms: conceptual elaboration sequence, theoretical elaboration sequence, simplifying conditions sequence

Elaboration Theory (Reigeluth)

The paradigm shift from teacher-centric instruction to learner-centered instruction has caused "new needs for ways to sequence instruction" (Reigeluth, 1999). Charles Reigeluth of Indiana University posited Elaboration Theory, an instructional design model that aims to help select and sequence content in a way that will optimize attainment of learning goals. Proponents feel the use of motivators, analogies, summaries and syntheses leads to effective learning. While the theory does not address primarily affective content, it is intended for medium to complex kinds of cognitive and psychomotor learning.

According to Reigeluth (1999), Elaboration Theory has the following values:

- It values a sequence of instruction that is as holistic as possible, to foster meaning-making and motivation
- It allows learners to make many scope and sequence decisions on their own during the learning process
- It is an approach that facilitates rapid protolyping in the instructional development process
- It integrates viable approaches to scope and sequence into a coherent design theory

There are three major approaches: (1) Conceptual Elaboration Sequence (used when there are many related concepts to be learned), (2) Theoretical Elaboration Sequence (used when there are many related principles to be learned), and (3) Simplifying Conditions Sequence (used when a task of at least moderate complexity is to be learned).

The simplest version of the concept, principle or task should be taught first. Teach broader, more inclusive concepts, principles, or tasks before the narrower, more detailed ones that elaborate upon them. One should use either a topical or a spiral approach to this elaboration. Teach "supporting" content such as principles, procedures, information, higher-order thinking skills, or attitudes together with the concepts to which they are most closely related. Group concepts, principles, or steps and their supporting content into "learning episodes" of a useful size (not too small or large). Finally, allow students to choose which concepts, principles, or versions of the task to elaborate upon or learn first (or next).

Criticisms

Some scholars have offered various criticisms of Elaboration Theory. For example, there is no prescription for providing "authentic" or "situated" learning. Also, the use of three primary structures (i.e. conceptual, procedural, and theoretical) is a design constraint. As conceptual structures are sequenced from the most general category down to the most detailed subcategory, elaboration theory does not accommodate learners' prior knowledge.

For more information, see:

- Reigeluth, C. (1987). Lesson blueprints based upon the elaboration theory of instruction. In C. Reigeluth (ed.), Instructional Design Theories in Action. Hillsdale, NJ: Erlbaum Associates.
- Reigeluth, C. (1992). Elaborating the elaboration theory. Educational Technology Research & Development, 40(3), 80-86.
- Reigeluth, C.M. (1999). The elaboration theory: Guidance for scope and sequence decisions. In C.M. Reigeluth (Ed.), *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory.* (Volume II). Hillsdale, NJ: Lawrence Erlbaum Assoc.

Distributed Cognition (DCog)

http://www.learning-theories.com/distributed-cognition-dcog.html

Summary: Distributed cognition is a branch of cognitive science that proposes cognition and knowledge are not confined to an individual; rather, it is distributed across objects, individuals, artefacts, and tools in the environment.

Originators: Edwin Hutchins in the 1990s.

Key Terms: Cognition in the Wild, mind in the world, artefacts, environment, representational media

Distributed Cognition (DCog)

Edwin Hutchins, a cognitive psychologist and anthropologist, studied how navigation is coordinated on US navy ships around San Diego. From his observations, he posited that the mind is in the world (as opposed to the world being in the mind). That is, the necessary knowledge and cognition to operate a naval vessel do not exist solely within one's head; knowledge and cognition is distributed across objects, individuals, artefacts, and tools in the environment. The goal of Distributed Cognition is to describe how distributed units are coordinated by analyzing the interactions between individuals, the representational media used, and the environment within which the activity takes place. The unit of analysis can therefore be described as systems that dynamically reconfigure their sub-systems to accomplish functions individuals, artifacts, their relations to each other (e.g. bridge of a ship, airplane cockpit, air traffic control). Distributed Cognition is about defining mechanisms of cognitive processes: e.g. memory in a cockpit encompasses internal processes, physical manipulation of objects, and the creation/exchange of external representations.

Distributed Cognition, which often makes use of ethnographically collected data, is not so much a method; more accurately, it is a useful descriptive framework that describes human work systems in informational and computational terms. It is useful for analyzing situations that involve problem-solving. As it helps provide an understanding of the role and function of representational media, it has implications for the design of technology in the mediation of the activity, because the system designers will have a stronger, clearer model of the work. Thus, it is an important theory for such fields as CSCL, CSCW, HCI, instructional design, and distance learning.

For more information, see:

- Hutchins, E. (1995). Cognition in the wild. MIT Press.
- Hutchins, E. (1995). How a cockpit remembers its speeds. Cognitive Science, 19, 265-288.
- Norman, D. A. (1993) Things that make us smart. Addison-Wesley.
- Perry, M. (2003). Distributed Cognition. In J.M. Carroll (Ed.) HCI Models, Theories, and Frameworks: Toward an Interdisciplinary Science. Morgan Kaufmann. pp. 193-223.

Problem-Based Learning (PBL)

http://www.learning-theories.com/problem-based-learning-pbl.html

Summary: Problem-Based Learning (PBL) is an instructional method of hands-on, active learning centered on the investigation and resolution of messy, real-world problems.

Originators: Late 1960s at the medical school at McMaster University in Canada.

Key Terms: open-ended problems, self-directed learners, teacher as facilitator, student as problem solver

Problem-Based Learning (PBL)

Problem-Based Learning (PBL) is a pedagogical approach and curriculum design methodology often used in higher education and K-12 settings.

The following are some of the defining characteristics of PBL:

- Learning is driven by challenging, open-ended problems with no one "right" answer
- Problems/cases are context specific
- Students work as self-directed, active investigators and problem-solvers in small collaborative groups (typically of about five students)
- A key problem is identified and a solution is agreed upon and implemented
- Teachers adopt the role as facilitators of learning, guiding the learning process and promoting an environment of inquiry

Rather than having a teacher provide facts and then testing students ability to recall these facts via memorization, PBL attempts to get students to apply knowledge to new situations. Students are faced with contextualized, ill-structured problems and are asked to investigate and discover meaningful solutions.

Proponents of PBL believe that, as a strategy, it:

- develops critical thinking and creative skills
- improves problem-solving skills
- increases motivation
- helps students learn to transfer knowledge to new situations

History

PBL's more recent influence can be traced to the late 1960s at the medical school at McMaster University in Canada. Shortly thereafter, three other medical schools -- the University of Limburg at Maastricht (the Netherlands), the University of Newcastle (Australia), and the University of New Mexico (United States) took on the McMaster model of problem-based learning. Various adaptations were made and the model soon found its way to various other disciplines -- business, dentistry, health sciences, law, engineering,

education, and so on.

Criticisms

One common criticism of PBL is that students cannot really know what might be important for them to learn, especially in areas which they have no prior experience. Therefore teachers, as faciliators, must be careful to assess and account for the prior knowledge that students bring to the classroom.

Another criticism is that a teacher adopting a PBL approach may not be able to cover as much material as a conventional lecture-based course. PBL can be very challenging to implement, as it requires a lot of planning and hard work for the teacher. It can be difficult at first for the teacher to "relinquish control" and become a facilitator, encouraging the students to ask the right questions rather than handing them solutions.

For more information, see:

- Interdisciplinary Journal of Problem Based Learning
- Barrows, H. S. & Tamblyn, R. M. (1980). Problem-based learning: An approach to medical education. New York: Springer.
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? Educational Psychology Review, 16, 235-266.
- Hmelo-Silver, C. E. & Barrows, H. S. (2006). Goals and strategies of a problem-based learning facilitator. Interdisciplinary Journal of Problem-based Learning, 1. 21-39.
- Savery, J. R., and Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. Educational Technology, 35, 31-38.
- Schmidt HG: Foundations of problem-based learning: some explanatory notes. Medical Education 27:422-432, 1993.

Experiential Learning (Kolb)

http://www.learning-theories.com/experiential-learning-kolb.html

Summary: A four-stage cyclical theory of learning, Kolb's experiential learning theory is a holistic perspective that combines experience, perception, cognition, and behavior.

Originators: David A. Kolb (1939-)

Key Terms: Learning cycles, learning styles, concrete experience, reflective observation, abstract conceptualization, active experimentation

Experiential Learning (Kolb)

Building upon earlier work by John Dewey and Kurt Levin, American educational theorist David A. Kolb believes "learning is the process whereby knowledge is created through the transformation of experience" (1984, p. 38). The theory presents a cyclical model of learning, consisting of four stages shown below. One may begin at any stage, but must follow each other in the sequence:

- concrete experience (or "DO")
- reflective observation (or "OBSERVE")
- abstract conceptualization (or "THINK")
- active experimentation (or "PLAN")

Figure 1. *Kolb's Experiential Learning Cycle*.

Kolb's four-stage learning cycle shows how experience is translated through reflection into concepts, which in turn are used as guides for active experimentation and the choice of new experiences. The first stage, *concrete experience* (CE), is where the learner actively experiences an activity such as a lab session or field work. The second stage, *reflective observation* (RO), is when the learner consciously reflects back on that experience. The third stage, *abstract conceptualization* (AC), is where the learner attempts to conceptualize a theory or model of what is observed. The fourth stage, *active experimentation* (AE), is where the learner is trying to plan how to test a model or theory or plan for a forthcoming experience.

Kolb identified four learning styles which correspond to these stages. The styles highlight conditions under which learners learn better. These styles are:

- assimilators, who learn better when presented with sound logical theories to consider
- convergers, who learn better when provided with practical applications of concepts and theories
- accommodators, who learn better when provided with "hands-on" experiences
- divergers, who learn better when allowed to observe and collect a wide range of information

For more information, see:

- Kolb, David A. 1984. Experiential Learning: Experience as the Source of Learning and

Development. Prentice-Hall, Inc., Englewood Cliffs, N.J.

Social Learning Theory (Bandura)

http://www.learning-theories.com/social-learning-theory-bandura.html

Summary: Bandura's Social Learning Theory posits that people learn from one another, via observation, imitation, and modeling. The theory has often been called a bridge between behaviorist and cognitive learning theories because it encompasses attention, memory, and motivation.

Originator: Albert Bandura

Key Terms: Modeling, reciprocal determinism

Social Learning Theory (Bandura)

People learn through observing others' behavior, attitudes, and outcomes of those behaviors. "Most human behavior is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action." (Bandura). Social learning theory explains human behavior in terms of continuous reciprocal interaction between cognitive, behavioral, and environmental influences.

Necessary conditions for effective modeling:

1. Attention -- various factors increase or decrease the amount of attention paid. Includes distinctiveness, affective valence, prevalence, complexity, functional value. One's characteristics (e.g. sensory capacities, arousal level, perceptual set, past reinforcement) affect attention.
2. Retention -- remembering what you paid attention to. Includes symbolic coding, mental images, cognitive organization, symbolic rehearsal, motor rehearsal
3. Reproduction -- reproducing the image. Including physical capabilities, and self-observation of reproduction.
4. Motivation -- having a good reason to imitate. Includes motives such asÂ past (i.e. traditional behaviorism), promised (imagined incentives) and vicarious (seeing and recalling the reinforced model)

Bandura believed in "reciprocal determinism", that is, the world and a person's behavior cause each other, while behaviorism essentially states that one's environment causes one's behavior, Bandura, who was studying adolescent aggression, found this too simplistic, and so in addition he suggested that behavior causes environment as well. Later, Bandura soon considered personality as an interaction between three components: the environment, behavior, and one's psychological processes (one's ability to entertain images in minds and language).

Social learning theory has sometimes been called a bridge between behaviorist and cognitive learning theories because it encompasses attention, memory, and motivation. The theory is related to Vygotsky's Social Development Theory and Lave's Situated Learning, which also emphasize the importance of social learning.

For more information, see:

- Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman.
- Bandura, A. (1986). Social Foundations of Thought and Action. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1973). Aggression: A Social Learning Analysis. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1977). Social Learning Theory. New York: General Learning Press.
- Bandura, A. (1969). Principles of Behavior Modification. New York: Holt, Rinehart & Winston.
- Bandura, A. & Walters, R. (1963). Social Learning and Personality Development. New York: Holt, Rinehart & Winston.

Constructivism

http://www.learning-theories.com/constructivism.html

Summary: Constructivism as a paradigm or worldview posits that learning is an active, constructive process. The learner is an information constructor. People actively construct or create their own subjective representations of objective reality. New information is linked to to prior knowledge, thus mental representations are subjective.

Originators and important contributors: Vygotsky, Piaget, Dewey, Vico, Rorty, Bruner

Keywords: Learning as experience, activity and dialogical process; Problem Based Learning (PBL); Anchored instruction; Vygotsky's Zone of Proximal Development (ZPD); cognitive apprenticeship (scaffolding); inquiry and discovery learning.

Constructivism

A reaction to didactic approaches such as behaviorism and programmed instruction, constructivism states that learning is an active, contextualized process of constructing knowledge rather than acquiring it. Knowledge is constructed based on personal experiences and hypotheses of the environment. Learners continuously test these hypotheses through social negotiation. Each person has a different interpretation and construction of knowledge process. The learner is not a blank slate (*tabula rasa*) but brings past experiences and cultural factors to a situation.

NOTE: A common misunderstanding regarding constructivism is that instructors should never tell students anything directly but, instead, should always allow them to construct knowledge for themselves. This is actually confusing a theory of pedagogy (teaching) with a theory of knowing. Constructivism assumes that all knowledge is constructed from the learner's previous knowledge, regardless of how one is taught. Thus, even listening to a lecture involves active attempts to construct new knowledge.

Vygotsky's social development theory is one of the foundations for constructivism.

Behaviorism

http://www.learning-theories.com/behaviorism.html

Summary: Behaviorism is a worldview that operates on a principle of "stimulus-response." All behavior caused by external stimuli (operant conditioning). All behavior can be explained without the need to consider internal mental states or consciousness.

Originators and important contributors: John B. Watson, Ivan Pavlov, B.F. Skinner, E. L. Thorndike (connectionism), Bandura, Tolman (moving toward cognitivism)

Keywords: Classical conditioning (Pavlov), Operant conditioning (Skinner), Stimulus-response (S-R)

Behaviorism

Behaviorism is a worldview that assumes a learner is essentially passive, responding to environmental stimuli. The learner starts off as a clean slate (i.e. *tabula rasa*) and behavior is shaped through positive reinforcement or negative reinforcement. Both positive reinforcement and negative reinforcement increase the probability that the antecedent behavior will happen again. In contrast, *punishment* (both positive and negative) decreases the likelihood that the antecedent behavior will happen again. Positive indicates the application of a stimulus; Negative indicates the withholding of a stimulus. Learning is therefore defined as a change in behavior in the learner. Lots of (early) behaviorist work was done with animals (e.g. Pavlov's dogs) and generalized to humans.

Behaviorism precedes the cognitivist worldview. It rejects structuralism and is an extension of Logical Positivism.

Radical behaviorism

Developed by BF Skinner, Radical Behaviorism describes a particular school that emerged during the reign of behaviorism. It is distinct from other schools of behaviorism, with major differences in the acceptance of mediating structures, the role of emotions, etc.

Affordance Theory (Gibson)

http://www.learning-theories.com/affordance-theory-gibson.html

Summary: Affordance theory states that the world is perceived not only in terms of object shapes and spatial relationships but also in terms of object possibilities for action (affordances) -- perception drives action.

Originators: J. J. Gibson (1904-1979)

Keywords: Affordances, direct perception, ecological

Affordance Theory (J. J. Gibson)

American psychologist James Jerome Gibson was influential in changing the way we consider visual perception. According to his theory, perception of the environment inevitably leads to some course of action. Affordances, or clues in the environment that indicate possibilities for action, are perceived in a direct, immediate way with no sensory processing. Examples include: buttons for pushing, knobs for turning, handles for pulling, levers for sliding, etc.

Based upon Gestalt theories, Affordance Theory has various implications for design, human-computer interaction, ergonomics, visualization, etc. Some believe that good design makes affordances explicit.

For more information, see:

- Gibson, J.J. (1977). The theory of affordances. In R. Shaw & J. Bransford (eds.), Perceiving, Acting and Knowing. Hillsdale, NJ: Erlbaum.
- Gibson, J.J. (1979). The Ecological Approach to Visual Perception. Boston: Houghton Mifflin.
- Norman, D. (1988). The Psychology of Everyday Things.Â New York, Basic Books, pp. 87-92.

Design-Based Research Methods (DBR)

http://www.learning-theories.com/design-based-research-methods.html

Summary: Design-Based Research is a lens or set of analytical techniques that balances the positivist and interpretivist paradigms and attempts to bridge theory and practice in education. A blend of empirical educational research with the theory-driven design of learning environments, DBR is an important methodology for understanding how, when, and why educational innovations work in practice; DBR methods aim to uncover the relationships between educational theory, designed artefact, and practice.

Originators: A. Brown (1992), A. Collins (1992), DBR Collective, and others

Keywords: design experiments, iterative, interventionist, theory-building, theory-driven

Design-Based Research Methods (DBR)

In recent years, educators have been trying to narrow the chasm between research and practice. Part of the challenge is that research that is detached from practice "may not account for the influence of contexts, the emergent and complex nature of outcomes, and the incompleteness of knowledge about which factors are relevant for prediction" (DBRC, 2003).

According to Collins et al. (2004), Design-based Research (also known as design experiments) intends to address several needs and issues central to the study of learning, including the following:

- The need to address theoretical questions about the nature of learning in context
- The need for approaches to the study of learning phenomena in the real world situations rather than the laboratory
- The need to go beyond narrow measures of learning.
- The need to derive research findings from formative evaluation.

Characteristics of design-based research experiments include:

- addressing complex problems in real, authentic contexts in collaboration with practitioners
- applying integrating known and hypothetical design principles to render plausible solutions
- conducting rigorous and reflective inquiry to test and refine innovative learning environments
- intertwined goals of (1) designing learning environments and (2) developing theories of learning
- research and development through continuous cycles of design, enactment, analysis, and redesign
- research on designs that must lead to sharable theories that help communicate relevant implications to practitioners and other educational designers
- research must account for how designs function in authentic settings
- development of such accounts relies on methods that can document and connect processes of enactment to outcomes of interest (DBRC, 2003).

Design-based research vs. traditional evaluation

The following excerpt highlights the difference between the goals and contributions of design-based research methods can offer and traditional evaluation:

"In traditional evaluation, an intervention (e.g. a textbook, an instructional program, a policy) is measured against a set of standards. During formative evaluation, iterative cycles of development, implementation, and study allow the designer to gather information about how an intervention is or is not succeeding in ways that might lead to better design. Then the intervention is 'frozen', and the rigorous summative evaluation begins....Like formative evaluation, design-based research uses mixed methods to analyze an intervention's outcomes and refine the intervention. Unlike evaluation research, design-based research views a successful innovation as a joint product of the designed intervention and the context. Hence, design-based research goes beyond perfecting a particular product. The intention of design-based research...is to inquire more broadly into the nature of learning in a complex system and to refine generative or predictive theories of learning. Models of successful innovation can be generated through such work -- models, rather than particular artifacts or programs, are the goal." (DBRC, 2003).

For more information, see:

- Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. The Journal of the Learning Sciences, 13(1).
- Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. The Journal of the Learning Sciences, 2(2): 141-178.
- Cobb, P., diSessa, A., Lehrer, R., Schauble, L. (2003). Design experiments in educational research. Educational Researcher, 32(1): 9-13.
- Collins, A. (1992). Towards a design science of education. In E. Scanlon & T. O'Shea (Eds.), New directions in educational technology (pp. 15-22). Berlin: Springer.
- Design-Based Research Collective. (2003). Design-based research: An emerging paradigm for educational inquiry. Educational Researcher, 32(1): 5-8.

GOMS Model (Card, Moran, and Newell)

http://www.learning-theories.com/goms-model-card-moran-and-newell.html

Summary: The GOMS Model is a human information processing model that predicts what skilled users will do in seemingly unpredictable situations.

Originators and proponents: Card, Moran and Newell in 1983; Bonnie John et al.

Keywords: Goals, operators, methods, selection rules

GOMS Model (Card, Moran, and Newell)

This model is the general term for a family of human information processing techniques that attempt to model and predict user behavior. Typically used by software designers, a person's behavior is analyzed in terms of four components:

- Goals - something that the person wants to accomplish. Can be high level (e.g. WRITE-PAPER) to low level (e.g. DELETE CHARACTER)
- Operators - basic perceptual, cognitive, or motor actions used to accomplish goals, or actions that the software allows user to make (e.g. PRESS-ENTER-KEY or CLICK-MOUSE)
- Methods - procedures (sequences) of subgoals and operators that can accomplish a goal
- Selection rules - personal rules users follow in deciding what method to use in a circumstance

One of the most validated methods in Human Computer Interaction (HCI), the GOMS model assumes expert user and well-defined tasks. It should be noted that there are various limitations to this technique, e.g.:

1. Task in question must be usefully analyzed in terms of the procedural (how to do it) knowledge.
2. Represents only skilled behavior. Not useful for ill-defined problem solving, exploration, etc. Cognitive walkthrough is useful for exploratory behavior by novices.
3. Need to start with a list of top-level tasks or user goals. List must be provided outside of GOMS.

GOMS is useful for uncovering a frequent goal supported by a very inefficient method thereby informing a design change to include a more efficient method.

Variations include:

- Keystroke Level Model (KLM) by Stuart Card: The first, simplest form of GOMS consisting of the sum of subtasks and required overhead. That is, the sum of the time of P - pointing, H - homing, D - drawing, M - mental operator, R - waiting for system response.
- Card Moran Newell (CMN)-GOMS: A serial stage model of GOMS.
- Critical Path Method (also known as Cognitive Perceptual Motor or CPM-GOMS): A parallel stage model (for users with highest level of skill) critical-path-method or cognitive-perceptual-motor analysis of activity - perceptual, cognitive, motor operators can be performed in parallel as the task

demands.

For more information, see:

- Card, S., Moran, T., and Newell, A. (1983) The Psychology of Human-Computer Interaction, Lawrence Erlbaum Associates, Hillsdale, NJ. [Book that introduces the GOMS model]
- John, B. and Kieras, D. E. (1996). Using GOMS for user interface design and evaluation: Which technique? ACM Transactions on Computer-Human Interaction (3) 4: 287-319. [Paper explains which GOMS variant to use depending on situation]
- John, B. and Kieras, D. E., (1996). The GOMS Family of User Interface Analysis Techniques: Comparison and Contrast, ACM Transactions on Computer-Human Interaction. (3) 4: 320-351.

Discovery Learning (Bruner)

http://www.learning-theories.com/discovery-learning-bruner.html

Summary: Discovery Learning is a method of inquiry-based instruction, discovery learning believes that it is best for learners to discover facts and relationships for themselves.

Originator: Jerome Bruner (1915-)

Keywords: Inquiry-based learning, constructivism

Discovery Learning (Bruner)

Discovery learning is an inquiry-based, constructivist learning theory that takes place in problem solving situations where the learner draws on his or her own past experience and existing knowledge to discover facts and relationships and new truths to be learned. Students interact with the world by exploring and manipulating objects, wrestling with questions and controversies, or performing experiments. As a result, students may be more more likely to remember concepts and knowledge discovered on their own (in contrast to a transmissionist model). Models that are based upon discovery learning model include: guided discovery, problem-based learning, simulation-based learning, case-based learning, incidental learning, among others.

Proponents of this theory believe that discovery learning has many advantages, including:

- encourages active engagement
- promotes motivation
- promotes autonomy, responsibility, independence
- the development of creativity and problem solving skills.
- a tailored learning experience

Critics have sometimes cited disadvantages including:

- creation of cognitive overload
- potential misconceptions
- teachers may fail to detect problems and misconceptions

The theory is closely related to work by Jean Piaget and Seymour Papert.

For more information, see:

- Bruner, J.S. (1967). On knowing: Essays for the left hand. Cambridge, Mass: Harvard University Press.

Activity Theory

http://www.learning-theories.com/activity-theory.html

Summary: Activity Theory is a framework or descriptive tool for a system. People are socio-culturally embedded actors (not processors or system components). There exists a hierarchical analysis of motivated human action (levels of activity analysis).

Originator: Vygotsky, Leont'ev, Luria, and others starting in the 1920s.

Key terms: Activity, action, operation, object-orientedness, internalization/externalization, mediation, development.

Activity Theory

Activity Theory is more of a descriptive meta-theory or framework than a predictive theory. Considers entire work/activity system (including teams, organizations, etc.) beyond just one actor or user. Accounts for environment, history of the person, culture, role of the artifact, motivations, complexity of real life action, etc.

The unit of analysis is *motivated activity directed at an object* (goal). Includes cultural and technical mediation of human activity, artifacts in use (and not in isolation). Activities consist of goal-directed actions that are conscious. Constituents of activity are not fixed; they can dynamically change.

Engestrom's model above is useful for understanding how a wide range factors work together to impact an activity. In order to reach an *outcome* it is necessary to produce certain *objects* (e.g. experiences, knowledge, and physical products) Human activity is mediated by artefacts (e.g. tools used, documents, recipes, etc.) Activity is also mediated by an organization or community. Also, the community may impose rules that affect activity. The subject works as part of the community to achieve the object. An activity normally also features a division of labour.

Three levels of activity:

- Activity towards an objective (goal) carried out by a community. A result of a motive (need) that may not be conscious social and personal meaning of activity (Answers the Why? question)
- Action towards a specific goal (conscious), carried out by an individual or a group possible goals and subgoals, critical goals (Answers the What? question)
- Operation structure of activity typically automated and not conscious concrete way of executing an action in according with the specific conditions surrounding the goal (Answers the How? question)

Principles:

1. Object-orientedness. (this is not to be confused with object-oriented programming) People live in a reality that is objective in a broad sense: the things that constitute this reality have not only the properties that are considered objective according to natural sciences but socially/culturally defined

properties as well.

2. Internalization/externalization. Distinction between internal and external activities. Internal activities cannot be understood if they are analyzed separately from external activities, because they transform into each other. Internalization is the transformation of external activities into internal ones. Internalization provides a means for people to try potential interactions with reality without performing actual manipulation with real objects (mental simulations, imaginings, considering alternative plans, etc.). Externalization transforms internal activities into external ones. Externalization is often necessary when an internalized action needs to be "repaired," or scaled. It is also important when a collaboration between several people requires their activities to be performed externally in order to be coordinated.
3. Mediation. Activity Theory emphasizes that human activity is mediated by tools in a broad sense. Tools are created and transformed during the development of the activity itself and carry with them a particular culture - historical remains from their development. So, the use of tools is an accumulation and transmission of social knowledge. Tool use influences the nature of external behavior and also the mental functioning of individuals.
4. Development. In Activity Theory development is not only an object of study, it is also a general research methodology. The basic research method in Activity Theory is not traditional laboratory experiments but the formative experiment which combines active participation with monitoring of the developmental changes of the study participants. Ethnographic methods that track the history and development of a practice have also become important in recent work.

All four of the above basic principles should be considered as an integrated system, because they are associated with various aspects of the whole activity.

For more information, see:

- Bertelsen, O. W. and S. Bodker. (2003) "Activity theory." In J.M. Carroll, ed., HCI models theories, and frameworks: toward a multidisciplinary science. San Francisco: Morgan Kaufmann, p. 291-324.
- Bodker, S. (1991). Through the interface: A human activity approach to user interface design. Hillsdale, NJ, Lawrence Erlbaum.
- Kaptelinin, V., Kuutti, K., Bannon, L. (1995). Activity Theory: Basic Concepts and Applications. In Blumenthal et al. (Eds.) Human-Computer Interaction. Lecture Notes in Computer Science. Springer.
- Leont'ev, A. N. (1978). Activity, Consciousness, Personality. Englewood Cliffs, NJ, Prentice Hall.
- Nardi, B., Ed. (1996). Context and Consciousness: Activity Theory and Human-Computer Interaction. Cambridge, MA, MIT Press.

Situated Learning Theory (Lave)

http://www.learning-theories.com/situated-learning-theory-lave.html

Summary: Situated Learning Theory posits that learning is unintentional and situated within authentic activity, context, and culture.

Originator: Jean Lave

Key Terms: Legitimate Peripheral Participation (LPP), Cognitive Apprenticeship

Situated Learning Theory (Lave)

In contrast with most classroom learning activities that involve abstract knowledge which is and out of context, Lave argues that learning is situated; that is, as it normally occurs, learning is embedded within activity, context and culture. It is also usually unintentional rather than deliberate. Lave and Wenger (1991) call this a process of "legitimate peripheral participation."

Knowledge needs to be presented in authentic contexts -- settings and situations that would normally involve that knowledge. Social interaction and collaboration are essential components of situated learning -- learners become involved in a "community of practice" which embodies certain beliefs and behaviors to be acquired. As the beginner or novice moves from the periphery of a community to its center, he or she becomes more active and engaged within the culture and eventually assumes the role of an expert.

Other researchers have further developed Situated Learning theory. Brown, Collins & Duguid (1989) emphasize the idea of cognitive apprenticeship: "Cognitive apprenticeship supports learning in a domain by enabling students to acquire, develop and use cognitive tools in authentic domain activity. Learning, both outside and inside school, advances through collaborative social interaction and the social construction of knowledge."

Situated learning is related to Vygotsky's notion of learning through social development.

For more information, see:

- Brown, J.S., Collins, A. & Duguid, S. (1989). Situated cognition and the culture of learning. Educational Researcher, 18(1), 32-42.
- Lave, J. (1988). Cognition in Practice: Mind, mathematics, and culture in everyday life. Cambridge, UK: Cambridge University Press.
- Lave, J., & Wenger, E. (1990). Situated Learning: Legitimate Periperal Participation. Cambridge, UK: Cambridge University Press.

ADDIE Model

http://www.learning-theories.com/addie-model.html

Summary: The ADDIE model is a systematic instructional design model consisting of five phases: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. Various flavors and versions of the ADDIE model exist.

Originator: Unknown. Refined by Dick and Carey and others.

Key terms: Analysis, Design, Development, Implementation, Evaluation

ADDIE Model

The generic term for the five-phase instructional design model consisting of Analysis, Design, Development, Implementation, and Evaluation. Each step has an outcome that feeds into the next step in the sequence. There are probably over 100+ different variations of the generic ADDIE model.

The five phases of ADDIE are as follows:

Analysis

- During analysis, the designer identifies the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints, the delivery options, and the timeline for the project.

Design

- A systematic process of specifying learning objectives. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user-interface and content is determined here.

Development

- The actual creation (production) of the content and learning materials based on the Design phase.

Implementation

- During implementation, the plan is put into action and a procedure for training the learner and teacher is developed. Materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated.

Evaluation

- This phase consists of (1) formative and (2) summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for

criterion-related referenced items and providing opportunities for feedback from the users. Revisions are made as necessary.

Rapid prototyping (continual feedback) has sometimes been cited as as a way to improve the generic ADDIE model.

For more information, see:

- Dick, W., & Carey, L. (1996). *The Systematic Design of Instruction* (4th Ed.). New York: Haper Collins College Publishers.
- Leshin, C. B., Pollock, J., & Reigeluth, C. M. (1992). *Instructional Design Strategies and Tactics*. Englewood Cliffs, NJ: Education Technology Publications.

Attribution Theory (Weiner)

http://www.learning-theories.com/weiners-attribution-theory.html

Summary: Attribution Theory attempts to explain the world and to determine the cause of an event or behavior (e.g. why people do what they do).

Originator: Bernard Weiner (1935-)

Key terms: Attribution, locus of control, stability, controllability

Attribution Theory (Weiner)

Weiner developed a theoretical framework that has become very influential in social psychology today. Attribution theory assumes that people try to determine why people do what they do, that is, interpret causes to an event or behavior. A three-stage process underlies an attribution:

1. behavior must be observed/perceived
2. behavior must be determined to be intentional
3. behavior attributed to internal or external causes

Weiner's attribution theory is mainly about achievement. According to him, the most important factors affecting attributions are ability, effort, task difficulty, and luck. Attributions are classified along three causal dimensions:

1. locus of control (two poles: internal vs. external)
2. stability (do causes change over time or not?)
3. controllability (causes one can control such as skills vs. causes one cannot control such as luck, others' actions, etc.)

When one succeeds, one attributes successes internally ("my own skill"). When a rival succeeds, one tends to credit external (e.g. luck). When one fails or makes mistakes, we will more likely use external attribution, attributing causes to situational factors rather than blaming ourselves. When others fail or make mistakes, internal attribution is often used, saying it is due to their internal personality factors.

1. Attribution is a three stage process: (1) behavior is observed, (2) behavior is determined to be deliberate, and (3) behavior is attributed to internal or external causes.
2. Achievement can be attributed to (1) effort, (2) ability, (3) level of task difficulty, or (4) luck.
3. Causal dimensions of behavior are (1) locus of control, (2) stability, and (3) controllability.

Stage Theory of Cognitive Development (Piaget)

http://www.learning-theories.com/piagets-stage-theory-of-cognitive-development.html

Summary: Piaget's Stage Theory of Cognitive Development is a description of cognitive development as four distinct stages in children: sensorimotor, preoperational, concrete, and formal.

Originator: Jean Piaget (1896-1980)

Key Terms: Sensorimotor, preoperational, concrete, formal, accommodation, assimilation.

Piaget's Stage Theory of Cognitive Development

Swiss biologist and psychologist Jean Piaget (1896-1980) observed his children (and their process of making sense of the world around them) and eventually developed a four-stage model of how the mind processes new information encountered. He posited that children progress through 4 stages and that they all do so in the same order. These four stages are:

- **Sensorimotor stage** (Birth to 2 years old). The infant builds an understanding of himself or herself and reality (and how things work) through interactions with the environment. It is able to differentiate between itself and other objects. Learning takes place via assimilation (the organization of information and absorbing it into existing schema) and accommodation (when an object cannot be assimilated and the schemata have to be modified to include the object.
- **Preoperational stage** (ages 2 to 4). The child is not yet able to conceptualize abstractly and needs concrete physical situations. Objects are classified in simple ways, especially by important features.
- **Concrete operations** (ages 7 to 11). As physical experience accumulates, accomodation is increased. The child begins to think abstractly and conceptualize, creating logical structures that explain his or her physical experiences.
- **Formal operations** (beginning at ages 11 to 15). Cognition reaches its final form. By this stage, the person no longer requires concrete objects to make rational judgements. He or she is capable of deductive and hypothetical reasoning. His or her ability for abstract thinking is very similar to an adult.

Multiple Intelligences Theory (Gardner)

http://www.learning-theories.com/gardners-multiple-intelligences-theory.html

Summary: Multiple Intelligences Theory posits that there are seven ways people understand in the world, described by Gardner as seven *intelligences*.

Originator: Howard Gardner in 1983.

Key Terms: Linguistic, Logical-Mathematical, Visual-Spatial, Body-Kinesthetic, Musical-Rhythmic, Interpersonal, Intrapersonal.

Multiple Intelligences Theory

Developed by Harvard psychologist Howard Gardner in 1983 and subsequently refined, this theory states there are at least seven ways ("intelligences") that people understand and perceive the world. These intelligences may not be exhaustive. Gardner lists the following:

- Linguistic. The ability to use spoken or written words.
- Logical-Mathematical. Inductive and deductive thinking and reasoning abilities, logic, as well as the use of numbers and abstract pattern recognition.
- Visual-Spatial. The ability to mentally visualize objects and spatial dimensions.
- Body-Kinesthetic. The wisdom of the body and the ability to control physical motion
- Musical-Rhythmic. The ability to master music as well as rhythms, tones and beats.
- Interpersonal. The ability to communicate effectively with other people and to be able to develop relationships.
- Intrapersonal. The ability to understand one's own emotions, motivations, inner states of being, and self-reflection.

This theory, while widely popular over the last two decades, has its share of critics. Some argue that Gardner's theory is based too much on his own intuition rather than empirical data. Others feel that the intelligences are synonymous for personality types.

Implications for Classrooms

The verbal-linguistic and logical-mathematical intelligences are the ones most frequently used in traditional school curricula. A more balanced curriculum that incorporates the arts, self-awareness, communication, and physical education may be useful in order to leverage the intelligences that some students may have.

For more information, see:

- Gardner, Howard. (1983) "Frames of Mind: The Theory of Multiple Intelligences."
- Gardner, Howard. (1993) "Multiple Intelligences: The Theory Into Practice."
- Gardner, Howard. (1999) "Intelligence Reframed: Multiple Intelligences for the 21st Century."

ARCS Model of Motivational Design (Keller)

http://www.learning-theories.com/kellers-arcs-model-of-motivational-design.html

Summary: According to John Keller's ARCS Model of Motivational Design, there are four steps for promoting and sustaining motivation in the learning process: Attention, Relevance, Confidence, Satisfaction (ARCS).

Originator: John Keller

Key terms: Attention, Relevance, Confidence, Satisfaction (ARCS)

ARCS Model of Motivational Design (Keller)

1. Attention

- Keller attention can be gained in two ways: (1) Perceptual arousal - uses surprise or uncertainly to gain interest. Uses novel, surprising, incongruous, and uncertain events; or (2) Inquiry arousal - stimulates curiosity by posing challenging questions or problems to be solved.
- Methods for grabbing the learners' attention include the use of:
  - Active participation -Adopt strategies such as games, roleplay or other hands-on methods to get learners involved with the material or subject matter.
  - Variability - To better reinforce materials and account for individual differences in learning styles, use a variety of methods in presenting material (e.g. use of videos, short lectures, mini-discussion groups).
  - Humor -Maintain interest by use a small amount of humor (but not too much to be distracting)
  - Incongruity and Conflict - A devil's advocate approach in which statements are posed that go against a learner's past experiences.
  - Specific examples - Use a visual stimuli, story, or biography.
  - Inquiry - Pose questions or problems for the learners to solve, e.g. brainstorming activities.

2. Relevance

- Establish relevance in order to increase a learner's motivation. To do this, use concrete language and examples with which the learners are familiar. Six major strategies described by Keller include:
  - Experience - Tell the learners how the new learning will use their existing skills. We best learn by building upon our preset knowledge or skills.
  - Present Worth - What will the subject matter do for me today?
  - Future Usefulness - What will the subject matter do for me tomorrow?
  - Needs Matching - Take advantage of the dynamics of achievement, risk taking, power, and affiliation.
  - Modeling - First of all, "be what you want them to do!" Other strategies include guest speakers, videos, and having the learners who finish their work first to serve as tutors.
  - Choice - Allow the learners to use different methods to pursue their work or allowing s choice in how they organize it.

3. Confidence

- Help students understand their likelihood for success. If they feel they cannot meet the objectives or that the cost (time or effort) is too high, their motivation will decrease.
- Provide objectives and prerequisites - Help students estimate the probability of success by presenting performance requirements and evaluation criteria. Ensure the learners are aware of performance requirements and evaluative criteria.
- Allow for success that is meaningful.
- Grow the Learners - Allow for small steps of growth during the learning process.
- Feedback - Provide feedback and support internal attributions for success.
- Learner Control - Learners should feel some degree of control over their learning and assessment. They should believe that their success is a direct result of the amount of effort they have put forth.

4. Satisfaction

- Learning must be rewarding or satisfying in some way, whether it is from a sense of achievement, praise from a higher-up, or mere entertainment.
- Make the learner feel as though the skill is useful or beneficial by providing opportunities to use newly acquired knowledge in a real setting.
- Provide feedback and reinforcement. When learners appreciate the results, they will be motivated to learn. Satisfaction is based upon motivation, which can be intrinsic or extrinsic.
- Do not patronize the learner by over-rewarding easy tasks.

For more information, see:

- Keller, J. M. (1983). Motivational design of instruction. In C. M. Reigeluth (Ed.), Instructional-design theories and models: An overview of their current status. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Keller, J. M. (1984). The use of the ARCS model of motivation in teacher training. In K. Shaw & A. J. Trott (Eds.), Aspects of Educational Technology Volume XVII: staff Development and Career Updating. London: Kogan Page.
- Keller, J. M. (1987). Development and use of the ARCS model of motivational design. Journal of Instructional Development, 10(3), 2-10. John Keller's Official ARCS Model Website

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Learning Theories

A resource on learning theories for educational psychology, cognitive science, human-computer interaction, instructional design, and other related fields.