

Learning Theories and Instruction

Learning Theory Matrix						
Definitive Questions for Learning Theories	Behaviorist Theory	Cognitive Theory	Constructivist Theory	Social Learning Theory	Connectivism	Adult Learning
How does learning occur?	Behavioral learning is focused around understanding and changing a learner's behavior. In order for behavior learning to be effective, it must be measurable and observable. "Behaviorism equates learning with changes in either form or frequency of observable performance. Learning is accomplished when a proper response is demonstrated following the presentation of a specific environmental stimulus." (Ertmer & Newby, 1993) The theory focuses on the importance of reinforcement and consequences.	Learning is associated with discrete changes between states of knowledge rather than with changes in the probability of response. Cognitive theories focus on the conceptualization of students' learning processes and tackle the issues of how information is received, organized, stored and retrieved by the mind. (Ertmer & Newby, 1993)	"Constructivism is a theory that equates learning with creating meaning from experience. Even though constructivism is considered to be a branch of cognitivism, it differentiates itself from traditional cognitive theories in a number of ways. Learners do not transfer knowledge from the external world into their memories; they build personal interpretations of the world based on individual experiences and exchanges. Therefore, the internal illustration of knowledge is constantly open to change; there is not an objective reality that learners strive to know." (Ertmer & Newby, 1993) Although Ormrod et al. note that Constructivism is not a theory but rather an epistemology, or philosophical explanation about the nature of learning (Simpson, 2002)." (Ormrod, Schunk, & Gredler, p. 184)	"Social constructivism emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding...Social constructivism is based on specific assumptions about reality, knowledge, and learning. To understand and apply models of instruction that are rooted in the perspectives of social constructivists, it is important to know the premises that underlie them. Reality: Social constructivists believe that reality is constructed through human activity. Members of a society together invent the properties of the world. For the social constructivist, reality cannot be discovered: it does not exist prior to its social invention. Knowledge: To social constructivists, knowledge is also a human product, and is socially and culturally constructed. Individuals create meaning through their interactions with each other and with the environment they live in. Learning: Social constructivists view learning as a social process. It does	Learning occurs "distributed within a network, social, technologically enhanced, recognizing and interpreting patterns." (Davis, Edmunds, & Kelly-Bateman, 2008) Principles of Connectivism: <ul style="list-style-type: none"> • Learning and knowledge rest in diversity of opinions. • Learning is a process of connecting specialized nodes or information sources. • Learning may reside in non-human appliances. • Capacity to know more is more critical than what is currently known. • Nurturing and maintaining connections is needed to facilitate continual learning. • Ability to see connections between fields, ideas, and concepts is a core skill. • Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities." (Davis, Edmunds, & Kelly-Bateman, 2008)	The development by Knowles of this theory illustrates that the designer "should involve learners in as many aspects of their education as possible and in the creation of a climate in which they can most fruitfully learn" (Merriam, 2001, p.7). Knowles' main focus with the development of andragogy was the notion of the material being very learner centered and the learner being very self-directed. Principles: <ul style="list-style-type: none"> • Adults need to be involved in the planning and evaluation of their instruction • Experience (including mistakes) provides the basis for learning activities • Adults are most interested in learning about subjects that have immediate relevance to their job or personal life • Adult learning is problem-centered rather than content-oriented" (Conlan, Grabowski, & Smith, 2003)

Learning Theories and Instruction

				not take place only within an individual, nor is it a passive development of behaviors that are shaped by external forces. Meaningful learning occurs when individuals are engaged in social activities.” (Kim, 2001)		
What factors influence learning?	Behavioral learning influences both by the learner’s abilities and prior knowledge, and the learner’s environment. All these conditions should be considered by the instructional designer when designing, developing and delivering curriculum in order to achieve the desired behavior change. “Although both learner and environmental factors are considered important by behaviorists, environmental conditions receive the greatest emphasis.” (Ertmer & Newby, 1993)	“Cognitive theories contend that environmental “cues” and instructional components alone cannot account for all the learning that results from an instructional situation...The real focus of the cognitive approach is on changing the learner by encouraging him/her to use appropriate learning strategies.” (Ertmer & Newby, 1993) Understanding how the brain works and effects a learner’s capability at learning and retaining knowledge is important to the way curriculum is designed, developed and delivered.	“Both learner and environmental factors are critical to the constructivist, as it is the specific interaction between these two variables that creates knowledge. Constructivists argue that behavior is situationally determined...it is critical that learning occur in realistic settings and that the selected learning task be relevant to the students’ lived experience.” (Ertmer & Newby, 1993)	The nature of the learner's social interaction with knowledgeable members of the society is important. Without the social interaction with more knowledgeable others, it is impossible to acquire social meaning of important symbol systems and learn how to use them. Young children develop their thinking abilities by interacting with adults.” (Kim, 2001)	“At its core, George Siemens’ theory of connectivism is the combined effect of three different components: chaos theory, importance of networks, and the interplay of complexity and self-organization. <ul style="list-style-type: none"> • Chaos Theory • Importance of Networks • Complexity • Self-Organization 	“Learning opportunities for adults exist in a variety of settings ranging from a formal institution to a place of employment. It is important to acknowledge prior knowledge and experiences of learners, including their ability to recognize their own skills as lifelong learners. Considerations for adult development and learning include biological and psychological development (including deterioration and disease processes that may occur) and sociocultural and integrative perspectives on development (Merriam, 1999).
What is the role of memory?	“Behaviorist techniques have long been employed in education to promote behavior that is desirable and discourage that which is not. Among the methods derived from behaviorist theory for practical classroom application are contracts, consequences, reinforcement, extinction, and behavior modification.” (Standridge, 2001)	“Learning occurs when information is stored in the memory in an organized, meaningful manner. Teachers and designers are responsible for assisting learners in organizing that information in some optimal way. Designers use techniques such as advanced organizers, analogies, hierarchical relationships and matrices to help learners relate new information to	The constructivist theory supports situated cognition. “Situated cognition (or learning) involves relations between a person and a situation; cognitive processes do not reside solely in one’s mind (Greeno, 1989).” (Ormrod, Schunk, & Gredler, p. 186)	Social constructivists see as crucial both the context in which learning occurs and the social contexts that learners bring to their learning environment. There are four general perspectives that inform how ID consultants could facilitate the learning within a framework of social constructivism (Gredler, 1997): Cognitive tools perspective, Idea-based social constructivism, pragmatic or emergent approach	“New technology forces the 21st century learner to process and apply information in a very different way and at a very different pace from any other time in history. As a result, the span of time between learning something new, being able to apply it, and finding that it is outdated and no longer useful continues to decrease. This phenomenon is what Gonzalez	The frontal lobes make up 40% of the adult brain. It was the last part of the human brain to evolve and is the last part to mature. It is where we plan, organize, correct, control, and generate options. It is also the first part of the brain to shut down and deteriorate with physical and/or emotional stress caused by the demands of modern life.” (Markus, 2003)

Learning Theories and Instruction

		prior knowledge.” (Ertmer & Newby, 1993)		and the transactional or situated cognitive perspectives.” (Kim, 2001)	refers to as the "half-life" of knowledge - the time span from when knowledge is gained until it becomes obsolete (2004). Since the advent of technology, from the radio to the internet, the half-life of knowledge has decreased significantly.” (Davis, Edmunds, & Kelly-Bateman, 2008)	
How does transfer occur?	“In behavioral learning theories, transfer is a result of generalization. Situations involving identical or similar features allow behaviors to transfer across common elements.” (Ertmer & Newby, 1993)	“Prior knowledge is used to establish boundary constraints for identifying the similarities and differences of novel information. Not only must the knowledge itself be stored in memory but the uses of that knowledge as well. Specific instructional or real world events will trigger particular responses, but the learner must believe that the knowledge is useful in a given situation before he will activate it.” (Ertmer & Newby, 1993)	“The constructivist position assumes that transfer can be facilitated by involvement in realistic tasks anchored in meaningful context. One of the essential concepts in the constructivist view is that learning always takes place in a context and that the context forms an inexorable link with the knowledge imbedded in it. Therefore, the goal of instruction is to accurately portray tasks, not to define the structure of learning required to achieve a task.” (Ertmer & Newby, 1993)	Social constructivists view both the context in which learning occurs and the social contexts that learners bring to their learning environment. There are four general perspectives that inform how we could facilitate the learning within a framework of social constructivism (Gredler, 1997): Cognitive tools perspective, Idea-based social constructivism, pragmatic or emergent approach and the transactional or situated cognitive perspectives.” (Kim, 2001)	Learning theories best explained by connectivism are “complex learning, rapid changing core, and diverse knowledge sources.” (Davis, Edmunds, & Kelly-Bateman, 2008) There is limited information on the theory of connectivism because it is so new. The introduction of technology into learning has prompted a change in the way we design, develop and deliver information.	
What types of learning are best explained by this theory?	“Modeling is also known as observational learning. Albert Bandura has suggested that modeling is the basis for a variety of child behavior. Children acquire many favorable and unfavorable responses by observing those around them... Shaping is the process of gradually changing	“Because of the emphasis on mental structures, cognitive theories are usually considered more appropriate for explaining complex forms of learning (reasoning, problem-solving, information-processing) than are those of a more behavioral perspective...Two techniques used by both camps in achieving this	“Constructivists believe that it is impossible to isolate units of information or divide up knowledge domains according to a hierarchical analysis of relationships...Constructivist learning environments are most effective for the stage of advanced knowledge acquisition, where initial	Instructional models based on the social constructivist perspective stress the need for collaboration among learners and with practitioners in the society (Lave & Wenger, 1991; McMahon, 1997). Lave and Wenger (1991) assert that a society’s practical knowledge is situated in relations among practitioners, their practice, and the	There is limited information on the theory of connectivism because it is so new. The introduction of technology into learning has prompted a change in the way we design, develop and deliver information. Because this is the newest of the theories, I believe all previous theories have contributed to its inception.	According to Adult Learning by Conlan, Grabowski & Smith, there are four learning theories linked to adult learning: <ul style="list-style-type: none"> • Action learning • Experiential learning • Project Based Learning • Self-directed learning Action learning is defined as an approach to working with, and

Learning Theories and Instruction

	<p>the quality of a response. The desired behavior is broken down into discrete, concrete units, or positive movements, each of which is reinforced as it progresses towards the overall behavioral goal. Cueing may be as simple as providing a child with a verbal or non-verbal cue as to the appropriateness of a behavior.” (Standridge, 2001)</p>	<p>effectiveness and efficiency of knowledge transfer are simplification and standardization...Behaviorists would focus on the design of the environment to optimize that transfer, while cognitivists would stress efficient processing strategies.” (Ertmer & Newby, 1993)</p>	<p>misconceptions and biases acquired during the introductory stage can be discovered, negotiated, and if necessary, modified and/or removed.” (Ertmer & Newby, 1993)</p>	<p>social organization and political economy of communities of practice. For this reason, learning should involve such knowledge and practice (Lave & Wenger, 1991; Gredler, 1997).</p>	<p>While this theory cannot support all of the strategies and ideas behind constructivism, cognitivism, behaviorism, I believe it’s important to an instructional designer to take them into account when designing, developing and delivering training. Learning theories best explained by connectivism are “complex learning, rapid changing core, and diverse knowledge sources.” (Davis, Edmunds, & Kelly-Bateman, 2008)</p>	<p>developing people, which uses work on a real project or problem as the way to learn. Participants work in small groups or teams to take action to solve their project or problem, and learn how to learn from that action. A learning coach works with the group in order to help them learn how to balance their work, with the learning from that work (O'Neil, 2000, p.44).’ Experiential learning is a learning theory that is learner-centered and operates on the premise that individuals learn best by experience. A good way to describe this theory is "learning by doing". Experiential learning thus has the learner directly involved with the material being studied instead of just thinking and talking about that material. In Project Based Learning, students work in groups to solve challenging problems that are authentic and often interdisciplinary. Learners decide how to approach a problem and what activities to pursue. This is comparable to the project based learning strategies as discussed in the ebook chapter Constructionism, Learning by Design, and Project Based Learning. There are three categories involved with self-directed learning: the goals, the process, and the learner. In an adult learning context, the goals are generally self-determined, as is the process. Self-directed</p>
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Learning Theories and Instruction

						learning can be enhanced with facilitation, particularly through providing resources. Motivation is key to a successful self-directed learning experience. This is very similar to the motivation that takes place in children during a self-regulated learning experience as mentioned in the Motivation Chapter of the ebook.
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Learning Theories and Instruction

How is technology used for learning in your industry?	<p>“Specific assumptions or principles that have direct relevance to instructional design include the following:</p> <ul style="list-style-type: none">• Behavioral objectives, task analysis, criterion-referenced assessment• Learner analysis• Sequencing of instructional presentation, mastery learning• Tangible rewards, informative feedback• Simple to complex sequencing of practice use of prompts” <p>(Ertmer & Newby, 1993)</p>	<p>“Specific assumptions or principles that have direct relevance to instructional design include:</p> <ul style="list-style-type: none">• Learner control, metacognitive training (e.g. self-planning, monitoring, and revising techniques).• Cognitive task analysis procedures.• Use of cognitive strategies such as outlining, summaries, synthesizers, advanced organizers, etc.• Recall of prerequisite skills; use of relevant examples, analogies.” <p>(Ertmer & Newby, 1993)</p>	<p>“Some of the specific strategies utilized by constructivists include situating tasks in real world contexts, use of cognitive apprenticeships (modeling and coaching a student toward expert performance), and presentation of multiple perspectives. The following are several specific assumptions or principles from the constructivist position that have direct relevance for the instructional designer:</p> <ul style="list-style-type: none">• Revisiting context at different times, in rearranged contexts, for different purposes, and from different conceptual perspectives• Developing pattern-recognition skills, presenting alternative ways of representing problems• Presenting new problems and situations that differ from the conditions of the initial instruction” <p>(Ertmer & Newby, 1993)</p>	<p>Social learning is probably most effective in a traditional classroom environment where all communication (verbal and non verbal) can be interpreted and responded to. An on-line classroom (or social networking site) is a valuable place to construct ideas and collaborate with peers; however it is the facilitators job to guide the learners to the stated objectives of the curriculum.</p>	<p>The concept of connectivism itself is supported by instructional design. A designer can build in a myriad of technology and networks to support effective learning. This can be accomplished through on-line training that provides links and attachments to additional information. An on-line classroom would also support connectivism in discussion and response portals, blog subscriptions and on-line libraries.</p>	<p>Much of adult learning occurs in a corporate environment involving a variety of training processes. In addition to applying the various learning styles discussed in previous ebook chapters, trainers/facilitators in such environments need to have a working skill set to meet the demands of fast-paced, changing environments. New trends involve instructional designers and facilitators becoming long-term assets to training departments. Expectations are for trainers to arrive not only with delivery skills, but also with design experience and application of learning theories in a variety of settings (Meyer, 2003).</p>
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Learning Theories and Instruction

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