# 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? | Uniformity | Information Processing | Your Own World | Can't do it alone | At the Point of Need | Continuously |
| What factors influence learning? | Environment | Learner's Mental Activities | Learner & Environment | Society | Networks | Life Experience |
| What is the role of memory? | Not typically addressed | Organization | Under Construction | External Hard Drive | Pattern Recognition | Needs Meaning |
| How does transfer occur? | Generalization | Knowing How | Contextual | I do what you do | Reciprocate | Relevancy & Application |
| What types of learning are best explained by this theory? | Memorization | Critical Thinking | Deeper Meaning | Make it Real | Rapidly Changing Core | Self-Directed |
| How is technology used for learning in your industry? | Stimuli-Response | Interactive | Collaboration | Let's Google it! | Connector | On-Demand |

References

# Learning Theories and Instruction

**Behaviorist – learning occurs……**

The learner starts off as a clean slate (i.e., tabula rasa) and behavior is shaped through positive reinforcement or negative reinforcement. *Behaviorism*. http://www.learning-theories.com/behaviorism.html.

For the behaviorist, learning results when students are taught to respond uniformly to an objective interpretation of reality. While reality may change in light of new discoveries, learning about reality is a matter of reinforcing correct responses and extinguishing incorrect ones. This orientation has led to a legion of school practices, such as textbook teaching, onesize-fits-all instructional methodology, ability grouping, norm-referenced testing, normal distribution curves, and rewards-and-punishment discipline programs. Jenkins, J. (2006). "Constructivism." *Encyclopedia of Educational Leadership and Administration.*

Three types of behavioral learning theories - **Contiguity**, **Classical (Respondent) Conditioning**, **Operant (Instrumental) Conditioning**. Huitt, W. & Hummel, J. (2006). *An Overview to the Behavioral Perspective*.

Major thinkers of Behaviorism – "*What is Behaviorism*?" Cherry, K. (n.d.)

Ivan Pavlov, B. F. Skinner, Edward Thorndike, John B. Watson, Clark Hull

Strengths of Behaviorism - "*What is Behaviorism*?" Cherry, K. (n.d.)

- Behaviorism is based upon observable behaviors, so it is easier to quantify and collect data and information when conducting research.
- Effective therapeutic techniques such as intensive behavioral intervention, behavior analysis, token economies and discrete trial training are all rooted in behaviorism. These approaches are often very useful in changing maladaptive or harmful behaviors in both children and adults.

Criticisms of Behaviorism – "*What is Behaviorism*?" Cherry, K. (n.d.)

- Many critics argue that behaviorism is a one-dimensional approach to understanding human behavior and that behavioral theories do not account for free will and internal influences such as moods, thoughts and feelings.
- Behaviorism does not account for other types of learning especially learning that occurs without the use of reinforcement and punishment.
- People and animals are able to adapt their behavior when new information is introduced, even if a previous behavior pattern has been established through reinforcement.

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# Learning Theories and Instruction

**Behaviorist - factors that influence learning….**

From Ertmer & Newby (1993)

Although both learner and environmental factors are considered important by behaviorists, environmental conditions receive the greatest emphasis.

The most critical factor, however, is the arrangement of stimuli and consequences within the environment.

- Instruction is structured around the presentation of the target stimulus and the provision of opportunities for the learner to practice making the proper response.

- To facilitate the linking of stimulus-response pairs, instruction frequently uses cues (to initially prompt the delivery of the response) and reinforcement (to strengthen correct responding in the presence of the target stimulus).

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# Learning Theories and Instruction

**Behaviorist - the role of memory….**

Memory is not typically addressed by behaviorists. Although the acquisition of "habits" is discussed, little attention is given as to how these habits are stored or recalled for future use. Forgetting is attributed to the "nonuse" of a response over time. The use of periodic practice or review serves to maintain a learner's readiness to respond (Schunk, 1991). Ertmer & Newby (1993).

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# Learning Theories and Instruction

**Behaviorist - transfer occurs….**

From Ormrod, J., Schunk, D., & Gredler, M. (2009). *Learning Theories and Instruction*

> Transfer refers to knowledge being applied in ways, in new situations, or in familiar situations with different content. Transfer also explains how prior learning affects subsequent learning.
>
> Transfer occurs through generalization. Skinner (1953). According to operant conditioning theory, transfer involves the generalization of responses from one discriminative stimulus to another.

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# Learning Theories and Instruction

**Behaviorist - types of learning best explained by this theory….**

From Ertmer & Newby (1993)

Learning that involves:

- Discriminations – recalling facts
- Generalizations – defining and illustrating concepts
- Associations – applying explanations
- Chaining – automatically performing a specified procedure

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## Learning Theories and Instruction

**Behaviorist – the use of Technology in learning….**

**In Education** – some examples are:

Study Island – "The Study Island user-friendly interface allows students to move through the program step-by-step. Each section has a pre-test and a post-test, as well as topics that cover each of the standards outlined in the NJ CCCS. Topics consist of questions, answers, explanations, and lessons that address specific skills required in order to master the New Jersey Core Curriculum Content Standards."

Note: each state has its own standards of "Study Island" usage.

Math is fun – K-12 Math learning in a fun way. This can fall into both Behaviorist (step by step learning) and Cognitivist (use of logic) realms.

Quizlet.com – "Quizlet is the **largest flash cards and study games website** with over 10 million free sets of flashcards covering every possible subject. It's the best place to play educational games, memorize vocabulary and study online."

**In Healthcare** – one example is **Neurofeedback**

From Center for Brain Training

> Neurofeedback is an innovative technology which harnesses the brain's neuroplasticity – its ability to change itself – in order to bring about improvement in a variety of symptoms which can interfere with life satisfaction. This non-medicine approach trains the brain to function optimally, thus improving attention, mood, learning ability and more.

From About Neurofeedback

> Neurofeedback uses a brain/computer interface. It detects brain activity. By using operant conditioning, you get rewarded when your brain makes more of certain types of brain activity. Your brain might get a beep when it's doing the right thing. By changing the EEG, changes occur in brain timing, and can create a more activated, alert, and stable brain. Or, a more calm brain. Excessive fast or slow activity is associated with brain dysregulation, and a variety of clinical symptoms. Training changes in that activity helps improve self-regulation.

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**Cognitivist – learning occurs…..**

Cognition – "the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses." New Oxford American Dictionary.

**From Ertmer & Newby (1993)**

> The real focus of the cognitive approach is on changing the learner by encouraging him/her to use appropriate learning strategies.
>
> Cognitive theories emphasize making knowledge meaningful and helping learners organize and relate new information to existing knowledge in memory.
>
> Learning is equated with discrete changes between states of knowledge rather than with changes in the probability of response.

**From Ormrod, J., Schunk, D., & Gredler, M. (2009)**

Assumptions

- Learners are active seekers and processors of information
- Human information processing is analogous to computer processing, at least metaphorically

Cognitive information processing theories focus on how people: (Schuell, 1986).

- **attend** to environmental events
- **encode** information to be learned and relate it to knowledge in memory
- **store** new knowledge in memory
- **retrieve** it as needed

Learning, or encoding occurs when information is stored in long-term memory.

Cognitive theories share several important ideas - Ponticell, Judith A. (2006). *Learning, Theories of.*

- People and animals may not learn in the same ways. People possess abilities unique to the species.
- Mental events are central to studying learning.

## Learning Theories and Instruction

**Cognitivist – learning occurs cont'd…..**

- The study of learning should be objective, and learning theories should be based on evidence. However, inferences can be drawn about the nature of internal mental events that produce observed responses.
- Individuals are actively involved in the learning process and control their own learning.
- Learning involves the formation of mental associations not necessarily reflected in overt behavior changes.
- Knowledge, beliefs, attitudes, and emotions are all associated and connected, that is, organized.
- Learning involves relating new information to previously learned information.

**Originators and important contributors** - Retrieved from http://www.learning-theories.com/cognitivism.html

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

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# Learning Theories and Instruction

**Cognitivist– factors that influence learning….**

**From Ertmer & Newby (1993)**

- Environmental conditions
- Learner's way of coding, transforming, rehearsing, storing, and retrieving information
- Learner's thoughts, beliefs, attitudes, and values

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# Learning Theories and Instruction

**Cognitivist – the role of memory…..**

**From Ertmer & Newby (1993)**

Learning results when information is stored in memory in an organized, meaningful manner.

Forgetting is the inability to retrieve information from memory because of interference, memory loss, or missing or inadequate cues needed to access information.

Techniques of organization include: Ertmer & Newby (1993), Ormrod, J., Schunk, D., & Gredler, M. (2009).

- Analogies
- Outlining
- Mapping
- Hierarchical relationships
- Mnemonics
- Grouping

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## Learning Theories and Instruction

**Cognitivist – transfer occurs….**

Current cognitive theories stress that transfer involves spreading activation in memory, where information is linked in memory networks such that recall of some information can trigger recall of other information. Transfer is more likely to occur when information is stored in multiple networks so that students understand the uses for various skills and knowledge. Ormrod, J., Schunk, D., & Gredler, M. (2009).

From Ertmer & Newby (1993)

- When a learner understands how to apply knowledge in different contexts, then transfer has occurred.
- Transfer is expedited if irrelevant information is eliminated.
- Focus on efficient processing strategies to optimize transfer.

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## Learning Theories and Instruction

**Cognitivist – types of learning explained by this theory…..**

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

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## Learning Theories and Instruction

**Cognitivist – the use of Technology in learning….**

Some examples of Educational Technology that apply Constructivist Theory:

Knowledge Probe Inc. - Educational "Card" Game and Companion Software for any Subject.

"ScholarCards ™ is educational software designed as a self-educating motivator for children learning various subjects.

- students are presented topics to study for a brief period.
- students are required to type their answers and thus facilitate greater learning.
- artificial intelligence analyzes how close and pertinent student answers are to the facts.
- not just a quiz - it is a unique game that focuses on levels of knowledge.
- uses the principles of constructivist theory to teach subject material.
- voice feedback reads facts to students." http://www.kprobe.com/kprobe/educards.htm

The River City Project – A Multi-User Virtual Environment for Learning Scientific Inquiry and 21st Century Skills – http://muve.gse.harvard.edu/rivercityproject/curriculum_in_practice.htm

"Funded by the National Science Foundation, River City is an "interactive computer simulation for middle grades science students to learn scientific inquiry and 21st century skills." The project places students in a virtual environment that looks and feels like a videogame but challenges them to work collaboratively to solve a health mystery. " http://www.educause.edu/ELI/LearningTechnologies/GamesSimulationsandVirtualWorl/11263

PublicHealthGames.com – its mission "To create state-of-the-art training for public health workers and emergency responders for a multitude of catastrophic scenarios.

Rocket Languages – conversational learning versus repetition based system.

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# Learning Theories and Instruction

**Constructivist – learning occurs…..**

Constructivism is a contemporary epistemology that holds that human beings construct knowledge by giving meaning to current experiences in light of prior knowledge, mental structures, experiences, and beliefs. It is based on the assumption that the source of a person's understanding of external phenomena is in the person's mind. The grid of the mind shapes the individual's responses. Some constructivists believe that there is no objective world independent of human mental activity. They claim that each individual creates his or her personal world, and any one world is no more real than the other. Other constructivists believe the mind is instrumental in interpreting events, objects, and perspectives in the real world and those interpretations produce a knowledge base that is idiosyncratic. Jenkins, J. (2006). *Constructivism*. In *Encyclopedia of educational leadership and administration*.

Some basic principles of constructivism applied to education: Jenkins, J. (2006).

- Knowledge is generated by both the external world and the subjective internal world of the learner.
- A learner's general and domain-specific knowledge determines the meaning that he or she derives from any experience.
- Each learner is an active participant in constructing meaning from external reality.
- Multiple interpretations of reality exist in any given instructional setting.
- Learning involves understanding concepts and procedures at ever-increasing levels of complexity.
- As learners advance in their learning, they form more accurate pictures of content and process

Originators and important contributors – http://www.learning-theories.com/constructivism.html

Jerome Bruner (1915-)
Jean Piaget (1896-1980)
Lev Vygotsky (1896-1934)
John Dewey (1859-1952)
Giambattista Vico (1668-1744)
Richard McKay Rorty (1931-2007)

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# Learning Theories and Instruction

**Constructivist – factors that influence learning….**

Both learner and environmental factors are critical to the constructivist, as it is the specific *interaction* between these two variables that creates knowledge. Ertmer & Newby (1993).

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# Learning Theories and Instruction

**Constructivist – the role of memory….**

To a constructivist, learning is more than memorizing material to pass a standardized test. It involves challenging students to develop new cognitive structures leading to more sophisticated meanings. The ability to solve difficult problems depends on the knowledge, skills, and strategies an individual owns generally and in a specific domain. Instruction is a developmental process that begins with a student's current level of functioning and moves him or her along a continuum toward expert performance. Jenkins, J. (2006).

The basic principles of constructivism suggest that earners are more apt to remember information if their constructions are personally meaningful to them. Ormrod, J., Schunk, D., & Gredler, M. (2009). *Learning Theories and Instruction.*

The emphasis is not on retrieving *intact* knowledge structures, but on providing learners with the means to create novel and situation-specific understandings by "assembling" prior knowledge from diverse sources appropriate to the problem at hand. Ertmer & Newby. (1993).

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**Constructivist – transfer occurs…..**

From Ertmer & Newby (1993).

> The constructivist position assumes that transfer can be facilitated by involvement in authentic tasks anchored in meaningful contexts.
>
> An essential concept in the constructivist view is that learning always takes place in a context and that the context forms an inexorable link with the knowledge embedded in it. (Bednar et al., 1991).
>
> If learning is decontextualized, there is little hope for transfer to occur.

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## Learning Theories and Instruction

**Constructivist – types of learning explained by this theory….**

Constructivist environments are best designed for meaningful, deep-structured learning, not for superficial understanding. True-false and multiple-choice tests may be inappropriate to assess learning outcomes. Authentic forms of assessment may require students to write reflective pieces, discussing what they learned and why this knowledge is useful in the world or to demonstrate and apply skills they have acquired. Ormrod, J., Schunk, D., & Gredler, M. (2009).

The role of instruction in the constructivist view is to show students how to construct knowledge, to promote collaboration with others to show the multiple perspectives that can be brought to bear on a particular problem, and to arrive at self-chosen positions to which they can commit themselves, while realizing the basis of other views with which they may disagree". (Cunningham, 1991, p.14). Ertmer & Newby (1993).

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## Learning Theories and Instruction

**Constructivist – the use of Technology in learning….**

EDUCAUSE Learning Institute provides a few examples of constructivist approach Technology used for learning – through games, simulations, and virtual worlds. http://www.educause.edu/ELI/LearningTechnologies/GamesSimulationsandVirtualWorl/11263. Here are two examples:

> The AET Zone (AETZ) is a multi-user virtual environment created by the faculty in the Instructional Technology program at Appalachian State University. AET Zone is our "campus" for online learning, constructed to support the social constructivist learning experiences we provide our students in our courses and our program. Below, please find some screenshots and descriptions of various elements of AETZ. http://www.lesn.appstate.edu/aetz/description.htm
>
> The ChemCollective, Carnegie-Mellon University - A collection of virtual labs, scenario-based learning activities, and concepts tests that can be incorporated into a variety of teaching approaches as prelabs, alternatives to textbook homework, and in-class activities for individuals or teams. It is organized by a group of faculty and staff at Carnegie Mellon University for college and high school teachers who are interested in using, assessing, and/or creating engaging online activities for chemistry education.

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# Learning Theories and Instruction

**Social Learning Theory – learning occurs….**

**Bandura -**
There are three core concepts at the heart of social learning theory. First is the idea that people can learn through observation. Next is the idea that internal mental states are an essential part of this process. Finally, this theory recognizes that just because something has been learned, it does not mean that it will result in a change in behavior. Cherry, K. (n.d).

From Instructional Design – Social Learning Theory (A. Bandura)

> The social learning theory of Bandura emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others.…..The component processes underlying observational learning are: (1) Attention, including modeled events (distinctiveness, affective valence, complexity, prevalence, functional value) and observer characteristics (sensory capacities, arousal level, perceptual set, past reinforcement), (2) Retention, including symbolic coding, cognitive organization, symbolic rehearsal, motor rehearsal), (3) Motor Reproduction, including physical capabilities, self-observation of reproduction, accuracy of feedback, and (4) Motivation, including external, vicarious and self reinforcement.

**Vygotsky –** From Ormrod, J., Schunk, D., & Gredler, M. (2009).

Key points in Vygotsky's theory:

- Social interactions are critical; knowledge is co-constructed between two or more people.
- Self-regulation is developed through internalization (developing an internal representation) of actions and mental operations that occur in social interactions.
- Human development occurs through the cultural transmission of tools (language, symbols).
- The ZPD is the difference between what children can do on their own and what they can do with assistance from others. Interactions with adults and peers in the ZPD promote cognitive development.

Learning continually occurs through social interactions and influences from the community, media and the Internet. Koch, C., (n.d.).

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# Learning Theories and Instruction

**Social Learning Theory – factors that influence learning….**

**From Ormrod, J., Schunk, D., & Gredler, M. (2009)**

> Vygotsyky's sociocultural theory emphasizes the social environment as a facilitator of development and learning. The social environment influences cognition through its tools—cultural objects, language, symbols, and social institutions.
>
> Learning is influenced by social interactions, interpersonal relations, and communication with others. (APA learner-centered principles).

Intrinsic Reinforcement - Bandura noted that external, environmental reinforcement was not the only factor to influence learning and behavior. He described intrinsic reinforcement as a form of internal reward, such as pride, satisfaction, and a sense of accomplishment. This emphasis on internal thoughts and cognitions helps connect learning theories to cognitive developmental theories. While many textbooks place social learning theory with behavioral theories, Bandura himself describes his approach as a 'social cognitive theory.' Cherry, K. (n.d.).

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# Learning Theories and Instruction

**Social Learning Theory – the role of memory…..**

**Learning does not necessarily lead to a change in behavior.**

> While behaviorists believed that learning led to a permanent change in behavior, observational learning demonstrates that people can learn new information without demonstrating new behaviors. Cherry, K. (n.d.).

This suggests to me that the role of memory depends on the motivation factor of the learner. That is, if the learner is motivated to reproduce the observed behavior, he/she has a greater desire for storing the knowledge in memory and retrieving it as needed. Furthermore, the "More Knowledgeable Others (MKO)" in the learner's social environment, as well as, the tools (cultural objects, language, symbols, and social institutions) can serve as a cue to the learner and make retrieval possible. In other words, the MKOs and the tools in the learner's social environment serve as an "external hard drive", to use a computer's analogy.

**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. Learning-Theories.com.

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**Social Learning Theory – transfer occurs…..**

When the socially observed behavior is adapted and reciprocated by the learner, transfer has occurred. For example, a mother who wants her child to set the table at meal time, will at first do it herself (ensuring the child is observing) for a while. When the mother feels that her child is ready to take on the responsibility, she will ask her to do it. The child's first attempt may not be as efficient as the mother would like it to be but after some practice and willingness to learn the behavior the child will do it efficiently.

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## Learning Theories and Instruction

**Social Learning Theory – types of learning explained by this theory…..**

"From the standpoint of the child, the great waste in school comes from his inability to utilize the experience he gets outside while on the other hand he is unable to apply in daily life what he is learning in school. That is the isolation of the school--its isolation from life." (John Dewey, 1916) - Retrieved from Meridian – A Middle School Computer Technologies Journal, Authentic Learning: A Practical Introduction & Guide for Implementation.

The type of learning explained by this position is learning that resembles a real-world situation—learning that requires collaboration, critical thinking, and problem solving; such as, Project Based Learning (PBL).

What is Project Based-Learning?

Project Based Learning is an instructional approach built upon authentic learning activities that engage student interest and motivation. These activities are designed to answer a question or solve a problem and generally reflect the types of learning and work people do in the everyday world outside the classroom. Project Based Learning is generally done by groups of students working together toward a common goal. Performance is assessed on an individual basis, and takes into account the quality of the product produced, the depth of content understanding demonstrated, and the contributions made to the ongoing process of project realization.

Some examples of Project Based Learning are:

- A Social Studies project, where students may be asked to build a "simulated" village of a certain community/country.
- A science (biology) project, where students analyze the life-cycle of bacteria in a particular local lake, or pond.

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**Social Learning Theory – the use of Technology in learning…..**

From Theories of Educational Technolgoy

> Technology provides multiple windows for social interactions. "One increasingly common technology-based strategy is to create online communities of students and adults who collaborate on specific problems" (Sherman & Kurshan, 2005, p. 12). With online communities, social interactions and learning occurs with students-to-students or even with students-to-professionals. "[One] can also facilitate depth of understanding by integrating technologies into the fabric of teaching as intellectual tools that students use to study, learn, and communicate with others in their classes as well as others in different locations" (Sherman & Kurshan, 2005, p. 12). The benefits of social interactions seem endless with the advancements of communications online. Koch, C. (n.d.).

Some examples of Technology in Social Learning:

- Facebook – social/professional networking site
- LinkedIn – professional networking site
- Personalized Wiki pages students and teachers create for a project
- TED – a site that "….offers free knowledge and inspiration from the world's most inspired thinkers, and also a community of curious souls to engage with ideas and each other."
- Wikipedia – a free collaboratively created online encyclopedia
- YouTube
- Google – search and you shall find

Additional examples fall under the Community Of Practice category – websites for specific groups (professional, social, or other) where individuals in the group share their knowledge and learn from one another. Examples of these groups are Community of Practice for Project Managers (PMI.org), Community Of Practice for Child Care providers and parents, such as, the eXtension Alliance for Better Child Care Community of Practice.

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**Connectivism – learning occurs…..**

From: **Knowing Knowledge by George Siemens (2006)**. Retrieved from http://www.elearnspace.org/KnowingKnowledge_LowRes.pdf

Connectivism is a theory describing how learning happens in a digital age. (p.30).

Learning and knowing occur in networks and ecologies, not hierarchical, pre-organized structures. The central filtering agent is no longer the newspaper, teacher, manager, or institution. It is the INDIVIDUAL. (p. 99).

**Traits of Learning Today** (pp. 27-28)

- **Chaotic** – Diverse and messy, not necessarily neatly packaged and arranged.
- **Continual** – Ongoing in development and communication. The model of "go to a course" is being replaced with learning and knowledge at the point of need.
- **Co-Creation** – Instead of content consumption (or passive learners involved in knowledge acquisition), experts and amateurs are now co-creators in knowledge.
- **Complexity** – Learning is a multi-faceted, integrated process where changes with any one element alters the larger network. Knowledge is subject to the nuances of complex, adaptive systems.
- **Connected Specialization** – Complexity and diversity results in specialized nodes (a single entity can no longer know all required elements). The act of knowledge growth and learning involves connected specialized nodes.
- **Continual Suspended Certainty** – We know in part. An attitude of tolerance for ambiguity and uncertainty is required. Certainty is for a season, not a lifetime.

**Principles of Connectivism** (p.31)

- Learning and knowledge require diversity of opinions to present the whole…and to permit selection of best approach.
- Learning is a network formation process of connecting specialized nodes or information sources.
- Knowledge rests in networks.
- Knowledge may reside in non-human appliances, and learning is enabled/facilitated by technology.

**Principles of Connectivism cont'd….** (p. 31)

- Capacity to know is more critical than what is currently known.
- Learning and knowing are constant, on going processes (not end states or products).
- Ability to see connections and recognize patterns and make sense between fields, ideas, and concepts is the core skill for individuals today.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is learning. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

**Major contributors** – George Siemens, Stephen Downes

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## Learning Theories and Instruction

**Connectivism – factors that influence learning…..**

- Networks and Connections
- Information Currency (up-to-date information)
- Digital tools – access to and ability to use technology for connecting and networking
- Learner's level of competence (in the use of technology/digital tools)
- Learner's motivation
- Interest level of learner on the subject

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**Connectivism – the role of memory……**

From: **Knowing Knowledge by George Siemens (2006)**. Retrieved from http://www.elearnspace.org/KnowingKnowledge_LowRes.pdf

**Pattern Recognition…** (p . 46)

> Individuals are network aware and competent. As dynamic participants in the ecology, they have moved from passive content consumption to active contribution. Time in the network has resulted in the learner developing an increased sense of what is happening in the network/ecology as a whole. Having mastered the basics of being a participant, they are now capable to recognize emerging patterns and trends. Experience within the network has resulted in an understanding the nuances of the space (online or physical). The longer an individual spends in the learning space, the more adept she/he will become at recognizing new patterns or *changing winds* of information and knowledge.

**Meaning-Making…** (p. 46)

> Individuals are capable of understanding *meaning*. What do the emerging patterns mean? What do changes and shifts in trends mean? How should the learner, adjust, adapt, and respond? Meaning-making is the foundation of action and reformation of view points, perspectives, and opinions.

We can no longer create certainty. Instead, we create ***patterns,*** reflective of a particular point in time, then we act, but we must remain connected to the original source in order to stay current (and we should actually feed back into the original source so that both learn). (p. 125).

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**Connectivism – transfer occurs…..**

When learner is able to contribute to the network—feedback, comment, new idea.

From: **Knowing Knowledge, George Siemens (2006**). Retrieved from http://www.elearnspace.org/KnowingKnowledge_LowRes.pdf

**Contribution and Involvement….**

> Individuals are fairly comfortable within their self-created network (though experts may continue to guide and direct their access to valuable resources). The learner begins to actively contribute to the network/ecology—essentially, becoming a "visible node." The learner's active contribution and involvement allows other nodes on the network to acknowledge his/her resources, contributions, and ideas—creating reciprocal relationships and shared understandings (or if social technology is used, collaboratively-created understanding). They should also be capable of choosing the right tool for the right learning task. (p. 45).

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**Connectivism – types of learning best explained by this theory….**

Conversational learning – self- to-network, and network-to-self

- Life-Long learning
- Collaborative learning in a diverse knowledge pool
- Learning that allows access to knowledge at a point in time (when needed)
- Constant, ongoing learning
- Complex, rapid changing core (Davis, C. E., & Kelly-Bateman, V., 2008)

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# Learning Theories and Instruction

**Connectivism – the use of Technology in learning…..**

Technology is a critical aspect in Connectivism. It is the means by which the learner forms connections.

Digital tools (computers, hand-held electronic devices) enable the learner access to the Internet where the required information resides. The learner connects with others through blogs, wikis, Community of Practices (CoPs), and other social media sites: both to give and receive information for knowledge.

Siemens (2006) in Knowing Knowledge, defines the "new oppressed" as:

- Those without access to tools of global conversation.
- Those without skills to contribute to global conversations.

Examples of the use of Technology

GoToMeeting or GoToWebinar – used for online meetings and webinars
Google Docs – for sharing/editing documents
Skype – video conferencing
Emails, Instant Messages
Wikis – creating collaboration websites
Prezi, preZent it, authorStream, SlideShare, and VCASMO – for online presentation

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**Adult Learner – learning occurs….**

In the words of Eduard C. Lindeman, from The Meaning of Adult Education, (1926) - Retrieved from http://archive.org/stream/meaningofadulted00lind

> The whole life is learning therefore education can have no endings. This new venture is called adult education—not because it is confined to adults but because adulthood, maturity, defines its limits. (p. 6).
>
> Its (adult education) purpose is to put meaning into the whole of life. (p. 7).

**Andragogy - Malcolm S. Knowles** – Retrieved from http://www.instructionaldesign.org/theories/andragogy.html

> Knowles' theory of andragogy is an attempt to develop a theory specifically for adult learning.
>
> In practical terms, andragogy means that instruction for adults needs to focus more on the process and less on the content being taught. Strategies such as case studies, role-playing, simulations, and self-evaluation are most useful. Instructors adopt a role of facilitator or resource rather than lecturer or grader.

**Five assumptions underlying andragogy** – Retrieved from http://www.infed.org/thinkers/et-knowl.htm

- Self-concept – adults can direct their own learning
- Experience – life experience is a significant resource for learning
- Readiness to learn – oriented to the developmental tasks of social roles
- Orientation to learning – immediacy of application
- Motivation to learn – is intrinsic

**Learning theories related to adult learning –** Conlan, J., Grabowksi, S., Smith, K. (2003).

- Action Learning – "Learning is cradled in the task" ABC of Action Learning. Revans, R., (2011). (p. 3)
- Experiential Learning – learning through experience
- Project Based Learning – working in groups to solve challenging problems
- Self-Directed Learning – taking initiative for one's own learning process

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# Learning Theories and Instruction

**Adult Learner - factors that influence learning….**

Conlan, J., Grabowski, S., Smith, K., (2003) noted a "briefcase" of factors affecting Adult Learning that may include:

- Life Experience
- Prior learning experience
- Work Experience
- Performance affecters, including cognitive abilities
- Time between learning interactions
- Age

A few more I'd like to add to the briefcase:

- Relevancy of subject
- Cultural/social background
- Motivational level
- Technological competence (use of computer, software, other devices)
- Purpose for learning

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# Learning Theories and Instruction

**Adult Learner – the role of memory…..**

Harsh, O. K., & Sohail, S. M. (2002) – Retrieved from IRRODL http://www.irrodl.org/index.php/irrodl/article/view/92/171

- Memory in adult students fades when faced with meaningless learning, learning that involves reassessment of old knowledge and rote memorization (Merriam et al., 1991). With age and increased levels of responsibility, adult learners' memories often become fragmented.

- Adult's short-term memory capacity is limited to about five to nine bits of new information at one time (Cruikshank et al., 1995). New information stored in short-term memory erodes with the passage of time. However, when the memory is overloaded, "chunking" information together that into categories enables adult learners to increase their short-term memory capacity (Dixon et al., 1994).

- Young and middle-aged learners, as a general rule, are more self-confident and tend to be goal oriented. Research shows that young and middle-aged learners are often able to memorize facts more easily than older adults. Adults in the middle years (age 35 to 45) have been found to be more responsible, a finding that is in accordance with our present experiment. As older adult students tend to be passive and less flexible (Cross, 1981), reintegration into educational settings must be emphasized. To maximize strengths and minimize weaknesses for the entire group, earning groups will ideally be composed of students of various ages.

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## Learning Theories and Instruction

**Adult Learner – transfer occurs…..**

When what is learned has immediate relevancy and is applied to the learner's work, social, personal, and/or societal goals.

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## Learning Theories and Instruction

**Adult Learner – types of learning best explained by this theory…..**

Self-directed Learning – with or without help from experts

Action Learning – learning by doing, on the job, on the project

Project Based Learning – learning by working in groups to solve problems

Experiential Learning – learning by experience

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## Learning Theories and Instruction

**Adult Learner – the use of Technology in learning…..**

Technology plays a major role in facilitating access to information learners need. The use of Technology for Adult Learners is similar to that of its use in Connectivism—to connect, to network, and to access information.

Online courses offered formally through institutions or informally (self-paced) are facilitated through the use of Technology. Some examples:

- International Institute for Learning, Inc.– learning as needed
- Rocket Languages – interactive language learning for anyone
- Walden University Online – formal online learning
- simplilearn – your pace, your place – Professional Development courses

Computers, Internet access, other communication devices, such as, iphones, cell-phones, and various applications (Word, PowerPoint, Email, Merlin, Adobe) are some of the technologies used in Adult Learning.

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