

THEORIES OF LEARNING

4. CONSTRUCTIVIST, SOCIAL, AND SITUATIONAL THEORIES

4.1. Constructivism Overview

Formalization of the theory of constructivism is generally attributed to Jean Piaget, who articulated mechanisms by which knowledge is internalized by learners. He suggested that through processes of accommodation and assimilation, individuals construct new knowledge from their experiences. When individuals assimilate, they incorporate the new experience into an already existing framework without changing that framework. This may occur when individuals' experiences are aligned with their internal representations of the world, but may also occur as a failure to change a faulty understanding; for example, they may not notice events, may misunderstand input from others, or may decide that an event is a fluke and is therefore unimportant as information about the world. In contrast, when individuals' experiences contradict their internal representations, they may change their perceptions of the experiences to fit their internal representations.

According to the theory, accommodation is the process of reframing one's mental representation of the external world to fit new experiences. Accommodation can be understood as the mechanism by which failure leads to learning as when we act on the expectation that the world operates in one way and it violates our expectations, we often fail, but by accommodating this new experience and reframing our model of the way the world works, we learn from the experience of failure, or others' failure. It is important to note that constructivism is not a particular pedagogy. In fact, constructivism is a theory describing how learning happens, regardless of whether learners are using their experiences to understand a lecture or following the instructions for building a model airplane. In both cases, the theory of constructivism suggests that learners construct knowledge out of their experiences. Social constructivism or socio-culturalism encourages the learner to arrive at his or her version of the truth, influenced by his or her background, culture or embedded worldview. Historical developments and symbol systems, such as language, logic, and mathematical systems, are inherited by the learner as a member of a particular culture and these are learned throughout the learner's life. This also stresses the importance of the nature of the learner's social interaction with knowledgeable members of the society. Without the social interaction with other more knowledgeable people, it is impossible to acquire social meaning of important

symbol systems and learn how to utilize them. Young children develop their thinking abilities by interacting with other children, adults and the physical world. From the social constructivist viewpoint, it is thus important to take into account the background and culture of the learner throughout the learning process, as this background also helps to shape the knowledge and truth that the learner creates, discovers and attains in the learning process

4.2. Cognitive Apprenticeship

Cognitive apprenticeship is a theory of the process where a master of a skill teaches that skill to an apprentice. Constructivist approaches to human learning have led to the development of a theory of cognitive apprenticeship. This theory holds that masters of a skill often fail to take into account the implicit processes involved in carrying out complex skills when they are teaching novices. To combat these tendencies, cognitive apprenticeships are designed, among other things, to bring these tacit processes into the open, where students can observe, enact, and practice them with help from the teacher. This model is supported by Albert Bandura's theory of modeling, which posits that in order for modeling to be successful, the learner must be attentive, must have access to and retain the information presented, must be motivated to learn, and must be able to accurately reproduce the desired skill.

Part of the effectiveness of the cognitive apprenticeship model comes from learning in context and is based on theories of situated cognition. Cognitive scientists maintain that the context in which learning takes place is critical. Based on findings such as these, researchers argue that cognitive apprenticeships are less effective when skills and concepts are taught independent of their real-world context and situation. As they state, situations might be said to co-produce knowledge through activity. Learning and cognition, it is now possible to argue, are fundamentally situated. In cognitive apprenticeships, the activity being taught is modeled in real-world situations. By using processes such as modeling and coaching, cognitive apprenticeships also support the three stages of skill acquisition described in the expertise literature: the cognitive stage, the associative stage, and the autonomous stage. In the cognitive stage, learners develop declarative understanding of the skill. In the associative stage, mistakes and misinterpretations learned in the cognitive stage are detected and eliminated while associations between the critical elements involved in the skill are strengthened. Finally, in the autonomous stage, the learner's skill becomes honed and perfected until it is executed at an expert level.

Like traditional apprenticeships, in which the apprentice learns a trade such as tailoring or woodworking by working under a master teacher, cognitive apprenticeships allow the master to model behaviors in a real-world context with cognitive modeling. By listening to the master explain exactly what she is doing and thinking as she models the skill, the apprentice can identify relevant behaviors and develop a conceptual model of the processes involved. The apprentice then attempts to imitate those behaviors with the master observing and providing coaching. Coaching provides assistance at the most critical level, the skill level just beyond what the learner/apprentice could accomplish by herself. Vygotsky referred to this as the Zone of Proximal Development and believed that fostering development within this zone leads to the most rapid development. The coaching process includes additional modeling as necessary, corrective feedback, and reminders, all intended to bring the apprentice's performance closer to that of the master's. As the apprentice becomes more skilled through the repetition of this process, the feedback and instruction provided by the master fades until the apprentice is, ideally, performing the skill at a close approximation of the master level.

4.3. Communities of Practice

Community of Practice (CoP) is, according to cognitive anthropologists Jean Lave and Etienne Wenger, a group of people who share a craft and/or a profession. The group can evolve naturally because of the members' common interest in a particular domain or area, or it can be created specifically with the goal of gaining knowledge related to their field. It is through the process of sharing information and experiences with the group that the members learn from each other, and have an opportunity to develop themselves personally and professionally. CoP's exist in offline, for example, a lunch room at work, a field setting, a factory floor, or elsewhere in the environment, but members of CoP's do not have to be co-located. They form a virtual community of practice (VCoP) when they collaborate online, such as within discussion boards and newsgroups, or a mobile community of practice (MCoP) when members communicate with one another via mobile phones and participate in community work on the go.

Communities of practice are not new phenomena: this type of learning practice has existed for as long as people have been learning and sharing their experiences through storytelling. In many organizations, communities of practice have become an integral part of the organization structure. These communities take on knowledge stewarding tasks that were formerly covered by more formal

organizational structures. In some organizations there are both formal and informal communities of practice. There is a great deal of interest within organizations to encourage, support, and sponsor communities of practice in order to benefit from shared knowledge that may lead to higher productivity. Communities of practice are now viewed by many in the business setting as a means to capturing the tacit knowledge, or the know how that is not so easily articulated. An important aspect and function of communities of practice is increasing organization performance. There are four areas of organizational performance that can be affected by communities of practice:

- Decreasing the learning curve of new employees
- Responding more rapidly to customer needs and inquiries
- Reducing rework and preventing reinvention of the wheel
- Spawning new ideas for products and services

4.4. Discovery Learning

Discovery learning is a technique of inquiry-based instruction and is considered a constructivist based approach to education. It is supported by the work of learning theorists and psychologists Jean Piaget, Jerome Bruner, and Seymour Papert. Although this form of instruction has great popularity, there is some debate in the literature concerning its efficacy. Jerome Bruner is often credited with originating discovery learning in the 1960s, but his ideas are very similar to those of earlier writers (e.g. John Dewey). Bruner argues that practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving. This philosophy later became the discovery learning movement of the 1960s. The mantra of this philosophical movement suggests that we should learn by doing. Discovery learning takes place in problem solving situations where the learner draws on his own experience and prior knowledge and is a method of instruction through which students interact with their environment by exploring and manipulating objects, wrestling with questions and controversies, or performing experiments.

Robert J. Marzano describes enhanced discovery learning as a process that involves preparing the learner for the discovery learning task by providing the necessary knowledge needed to successfully complete said task. In this approach, the teacher not only provides the necessary knowledge required to complete the task, but also provides assistance during the task. This preparation of the learner and assistance may require some direct instruction. Another aspect of enhanced

discovery learning is allowing the learner to generate ideas about a topic along the way and then having students explain their thinking. A teacher who asks the students to generate their own strategy for solving a problem may be provided with examples in how to solve similar problems ahead of the discovery learning task. A student might come up to the front of the room to work through the first problem, sharing his or her thinking out loud. The teacher might question students and help them formulate their thinking into general guidelines for estimation, such as start by estimating the sum of the highest place-value numbers. As others come to the front of the room to work their way through problems out loud, students can generate and test more rules.

4.5. Social Development Theory

Social development theory attempts to explain qualitative changes in the structure and framework of society, that help the society to better realize its aims and objectives. Development can be broadly defined in a manner applicable to all societies at all historical periods as an upward ascending movement featuring greater levels of energy, efficiency, quality, productivity, complexity, comprehension, creativity, mastery, enjoyment and accomplishment. Development is a process of social change, not merely a set of policies and programs instituted for some specific results. During the last five centuries this process has picked up in speed and intensity, and during the last five decades has witnessed a marked surge in acceleration. The basic mechanism driving social change is increasing awareness leading to better organization. When society senses new and better opportunities for progress it develops new forms of organization to exploit these new openings successfully. The new forms of organization are better able to harness the available social energies and skills and resources to use the opportunities to get the intended results. Development is governed by many factors that influence the results of developmental efforts. There must be a motive that drives the social change and essential preconditions for that change to occur. The motive must be powerful enough to overcome obstructions that impede that change from occurring. Development also requires resources such as capital, technology, and supporting infrastructure.

Development is the result of society's capacity to organize resources to meet challenges and opportunities. Society passes through well-defined stages in the course of its development. They are nomadic hunting and gathering, rural agrarian, urban, commercial, industrial, and post-industrial societies. Pioneers introduce new ideas, practices, and habits that conservative elements initially resist. At a later

stage, innovations are accepted, imitated, organized, and used by other members of the community. Organizational improvements introduced to support the innovations can take place simultaneously at four different levels; physical, social, mental, and psychological. Moreover four different types of resources are involved in promoting development. Of these four, physical resources are most visible, but least capable of expansion. Productivity of resources increases enormously as the quality of organization and level of knowledge inputs rise.

4.6. Problem-Based Learning

Problem-Based learning (PBL) is a student-centered pedagogy in which students learn about a subject through the experience of problem solving. Students learn both thinking strategies and domain knowledge. The PBL format originated from the medical school of thought, and is now used in other schools of thought too. The goals of PBL are to help the students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills and intrinsic motivation. Problem-Based learning is a style of active learning. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem. The role of the instructor (known as the tutor in PBL) is to facilitate learning by supporting, guiding, and monitoring the learning process. The tutor must build students' confidence to take on the problem, and encourage the students, while also stretching their understanding. PBL represents a paradigm shift from traditional teaching and learning philosophy, which is more often lecture-based. The constructs for teaching PBL are very different from traditional classroom/lecture teaching.

PBL addresses the need to promote lifelong learning through the process of inquiry and constructivist learning. PBL can be considered a constructivist approach to instruction, emphasizing collaborative and self-directed learning and being supported by flexible teacher scaffolding. Research elaborates on the cognitive constructivist process of PBL:

1. Learners are presented with a problem and through discussion within their group, activate their prior knowledge.
2. Within their group, they develop possible theories or hypotheses to explain the problem. Together they identify learning issues to be researched. They construct a shared primary model to explain the problem at hand. Facilitators

provide scaffold, which is a frame work on which students can construct knowledge relating to the problem.

3. After the initial team work, students work independently in self-directed study to research the identified issues.
4. The students re-group to discuss their findings and refine their initial explanations based on what they learned.

4.7. Situated Learning

Situated learning was first proposed by Jean Lave and Etienne Wenger as a model of learning in a community of practice. At its simplest, situated learning is learning that takes place in the same context in which it is applied. Lave and Wenger argue that learning should not be viewed as simply the transmission of abstract and de-contextualized knowledge from one individual to another, but a social process whereby knowledge is co-constructed; they suggest that such learning is situated in a specific context and embedded within a particular social and physical environment. This type of learning allows an individual (students/learner) to learn by socialization, visualization, and imitation. Learning begins with people trying to solve problems. When learning is problem based, people explore real life situations to find answers, or to solve the problems. Research also focuses on how important being social is to learning. In believing that learning is social, learners who gravitate to communities with shared interests tend to benefit from the knowledge of those who are more knowledgeable than they are. These social experiences provide people with authentic experiences. When students are in these real-life situations they are compelled to learn. Researchers conclude that taking a problem-based learning approach to designing curriculum carries students to a higher level of thinking.

Situated learning is becoming more involved with technology in ways to help individuals learn information differently than they have in the past. The model of learning a skill through technology mimics how individuals learned in the past from a professional in that skill. In the past when individuals learned about a particular topic it was done in person, in a hands-on environment. Technology makes it possible to do these same things using a computer or any other similar device. Interaction through the computer between individuals is one more way to make situated learning more successful as well as give students an opportunity to have another venue through which to learn. In fact, an understanding of video games as learning environments is becoming increasingly important as gaming culture rivals schooling for the attention of children and adolescents across the

world. Instruction must be situated in an authentic context that resembles that of the classroom teacher to enrich their learning process by providing realistic experiences that more easily transfer. Students process information by visualizing, hearing, reasoning and reflecting so they tend to learn more easily by having models to go by or imitate. In some study cases, teachers have gone as far as to make the classroom environment as homey as possible, whether it is a computerized set up or a physical set up. It gives the students the look and feel of being at home in a comfortable setting which allows them to feel and learn freely. It has been proven to have a great impact on the students learning abilities. This is another innovative way of utilizing situated learning.