

# ECI 660 Cognition and Instructional Design

## Driscoll Reading Notes

### Chapter One

#### Overview

This chapter first attempts to set the problem of the course: what is learning and how does theory interact with the pursuit of this answer? Driscoll leads to a proposal for defining learning and then carries that into learning theory.

Next, a quick discussion of epistemology takes place. According to Webster, epistemology is “the study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity.” In other words, what counts as knowledge.

Finally, an overview of early experimental traditions is given. It is from these four programs that most of our current learning theories have sprung. Note that all formed in the age of Science; consideration of how we learn ceased to be philosophy and joined the then new field of psychology.

#### Terms to know

Epistemology	Objectivism	Pragmatism
Interpretivism	Principle of association	Law of effect
Classical Conditioning	Gestalt	Theory
Learning	Recursive	Empiricism
Reationalism		Plug-in

#### Notes

##### Theories

I can think of no word that makes students cringe more than Theory. Yet this first part of the book takes time to give a rich description of what theories are, how they are formed and refined, and finally how they can be used. In their most basic form, theories help humans solve questions affecting their lives. We really all live based upon our working theories of life, other drivers, human relations and an infinite amount of other things.

Get a good understanding of the question process. There are at least three types of questions; list them and see if you can think of examples. Good questions lead to good learning. And all this leads to recursion, that lovely cycle of constant change.

She ends this section with an interesting discussion about normal science, the fragmentation of theory and E.O. Wilson’s notion of consilience. To me this is a forrest/tree thing. Theory, especially “scientific” theory, tends to over specialize to the point where its effects are not wholly appreciated. Also, it’s positive contributions are compromised by not considering similar problems from nearby disciplines. Wilson makes a facinating attempt at finding a way out of this

dilema.

## **Defining Learning and Learning Theory**

There are two basic, universal assumptions in learning theories. Be sure to list them in understand their contributions. Then think about what they leave out. For instance, many people view learning as something that happens in only formal institutional settings.

Similarly, Driscoll lists three components that must make up any learning theory. These are factors that must be taken into account for a theory to be valid. Etch these in your brains! we are going to come back to them in each subsequent chapter to set the many theories we are exploring. Write them in the front cover of the book; tattoo them to your arm. Whatever it takes.

## **Epistemology of Learning.**

In order to have a theory, one must be decided upon what knowledge is? This is where one's epistemic stance comes in. Simply a) What is knowledge? and b) How is it represented in Mind?. How one answers these questions serves to limit the kinds of theories that can be built. A common contemporary summation of the dichotomy of knowledge is that its either "out there" or "internally constructed." From your choice of these two things, you are either a Positivist or a Relativist. A Positivist cannot be a constructivist, and a Relativist cannot be a behaviorist.

Epistemologies of learning break into the following three ideas. They are well summed up in table 1.1 and figure 1.3.

### **Objectivism Theory**

This was developed in an attempt to overcome the weaknesses associated with Greek copy theory, which basically asserted that we learn by copying things in nature. Objectivism assumes that objects can be directly perceived and known. This means that the knower apprehends sensory data corresponding to features or properties of an object. Empiricism was a result of objectivist theory. Empiricism is acquiring knowledge through experience and is a fundamental element of research because research is the systematic gathering of data or experiences.

### **Interpretivism**

Interpretivism offers a different view of knowledge and learning. Plato initiated interpretivism and Kant expanded on it. The interpretist view of knowledge emphasized the active and dynamic nature of the cognizing organism. The mind does not passively accept sensory impressions. Instead, according to the interpretists view, the mind imposes an organizational and interpretive framework on sense data.

### **Pragmatism**

Another major epistemology of learning is pragmatism. Pragmatism holds the middle ground between objectivism and interpretivism. Pragmatists acknowledge the existence of reality but argue that it cannot be known directly. They accept the copy theory but with modification. Knowledge is not absolute, rather it is provisional. This means that sometimes our mental copies or beliefs will not accurately reflect reality.

## **Early Experimental Approaches to Learning**

### **Association**

Among the first in psychology to address the process of learning was Hermann Ebbinghaus. Ebbinghaus based his learning theories on the theory that ideas become connected or associated through experience. The more a person encounters an association, the stronger the associative bond is assumed to be.

Ebbinghaus presumed, that if ideas are connected by the frequency of their associations, learning should be predictable based on the number of times a given association is experienced.

## **Effect**

Edward L. Thorndike was also interested in associationism but from a different perspective. Thorndike was interested in the association between sensation and impulse. This interest led to Thorndike's development of the early experimental procedures to be used in the study of animal learning. The results of such experiments convinced Thorndike that an animal learned to associate a sensation and an impulse when its actions had satisfying results. This principle became known as the *Law of Effect*.

## **Classical Conditioning**

A third major experimental learning approach, pioneered by Ivan Pavlov, involved the study of associations together with associationism and reflexology. Pavlov experimented with dogs where he tested the reflexology by providing a variety of stimuli, even inappropriate ones. He found that dogs will salivate to a variety of stimuli including the sight of the trainer. Pavlov called this reaction to the sight of the trainer a learned reflex that was established because of an association between the appropriate stimulus (food) and the inappropriate one (the trainer). Classical conditioning theory was based on the idea that an unconditioned stimulus will elicit an unconditioned response. If the unconditioned stimulus is repeated frequently enough, the learner will make an association with the unconditioned stimulus. Once the association has occurred, the unconditioned stimulus becomes a conditioned stimulus that elicits a conditioned response. Over time the conditioned stimulus can be reduced in frequency and the conditioned response will still occur.

Operant conditioning is based on Pavlov's research into classical conditioning. The principles of stimulus generalization and discrimination, extinction, and counter conditioning that were developed by Pavlov are now used in a therapeutic technique for treating various types of fears or anxieties.

## **Gestalt Theory**

was developed during the early part of 20th century by German theorists such as Wolfgang Kohler. The Kohler experiments involved the use of apes. Kohler argued that the apes in the experiment learned relations among stimuli and could modify their behavior by perceiving stimuli in new ways. Kohler called such behavior insight. He believed the behavior he observed of the apes in the experiments could not be explained by association alone. Kohler developed what was known as a "class of inner process." The apes in the experiments acquired a relation between two things, an "interconnection based on the properties of the things themselves, not a mere 'frequent following of each other' or an 'occurring together.'"