

Cognitive/Learning Styles

Cognitive styles refer to the preferred way an individual processes information. Unlike individual differences in abilities (e.g., [Gardner](#), [Guilford](#), [Sternberg](#)) which describe peak performance, styles describe a person's typical mode of thinking, remembering or problem solving. Furthermore, styles are usually considered to be bipolar dimensions whereas abilities are unipolar (ranging from zero to a maximum value). Having more of an ability is usually considered beneficial while having a particular cognitive style simply denotes a tendency to behave in a certain manner. Cognitive style is a usually described as a personality dimension which influences attitudes, values, and social interaction.

A number of cognitive styles have been identified and studied over the years. Field independence versus field dependence is probably the most well known style. It refers to a tendency to approach the environment in an analytical, as opposed to global, fashion. At a perceptual level, field independent personalities are able to distinguish figures as discrete from their backgrounds compared to field dependent individuals who experience events in an undifferentiated way. In addition, field dependent individuals have a greater social orientation relative to field independent personalities. Studies have identified a number connections between this cognitive style and learning (see Messick, 1978). For example, field independent individuals are likely to learn more effectively under conditions of intrinsic motivation (e.g., self-study) and are influenced less by social reinforcement.

Other cognitive styles that have been identified include:

- scanning - differences in the extent and intensity of attention resulting in variations in the vividness of experience and the span of awareness
- leveling versus sharpening - individual variations in remembering that pertain to the distinctiveness of memories and the tendency to merge similar events
- reflection versus impulsivity - individual consistencies in the speed and adequacy with which alternative hypotheses are formed and responses made
- conceptual differentiation - differences in the tendency to categorize perceived similarities among stimuli in terms of separate concepts or dimensions

Learning styles specifically deal with characteristic styles of learning. Kolb (1984) proposes a theory of experiential learning that involves four principal stages: concrete experiences (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). The CE/AC and AE/RO dimensions are polar opposites as far as learning styles are concerned and Kolb postulates four types of learners (divergers, assimilators, convergers, and accommodators) depending upon their position on these two dimensions. For example, an accommodator prefers concrete experiences and active experimentation (AE, CE).

[Pask](#) has described a learning style called serialist versus holist. Serialists prefer to learn in a sequential fashion, whereas holists prefer to learn in a hierarchical manner (i.e., top-down).

Theoretically, cognitive and learning styles could be used to predict what kind of instructional strategies or methods would be most effective for a given individual and learning task. Research to date on this problem has not identified many robust relationships (see [Cronbach & Snow](#)). However, the 4MAT framework based on the work of Bernice McCarthy which suggests 4 learning modes (Analytic, Imaginative, Common Sense, and Dynamic) has been widely applied in education (see <http://www.aboutlearning.com>). And the learning styles framework developed by Dunn & Dunn (1999) seems to be useful in terms of creating teacher awareness of individual differences in learning (see <http://www.learningstyles.net>).

For more about Learning Styles, see <http://snow.utoronto.ca/Learn2/mod3/index.html> or <http://www.oswego.edu/~shindler/lstyle.htm>. Application of learning styles to engineering is discussed at http://www2.ncsu.edu/unity/lockers/users/f/felder/public/Learning_Styles.html. Discussion about the relationship between learning styles and the Multiple Intelligences theory of Gardner can be found at <http://www.ldpride.net/learningstyles.MI.htm> and <http://falcon.jmu.edu/~ramseyil/learningstyles.htm>.

References:

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