

# The Importance of Learning Styles in Education

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## **Abstract**

Learning styles play a vital role in the learning process and contribute to the overall educational environment. This literature review reviews various dimensions of learning styles in an effort to bring to light their contribution to both the learning and teaching process. The information provided within this article can help educators develop teaching methods that best match each learner's learning style. Understanding the characteristics of learners in each dimension will not only enhance teaching, but the overall learning process as well.

## **Introduction**

Learning styles have been shown to play an important role in the learning process. Each person has his/her own particular learning style that determines how he/she interacts with his/her learning environment. Understanding the relationship between learning styles and the learning process, is one of the primary goals of learning styles research. Learning styles research is based on the theory that individuals have different stimulus sense modalities from which they prefer to absorb, retain and process new information (Cassidy & Eachus, 2000; Dunn, 1983; Harrison, Andrews, & Saklofske, 2003). The information gained from learning styles research provides researchers with knowledge that can be helpful in improving the overall quality of learning as well as the learning environment.

## **Overview of Learning Styles**

Before 1979, the term cognitive style was widely used to describe the different methods that individuals employed to perceive, think about, and solve problems (Claxton & Murrell, 1987; Griggs, 1991). Researchers later coined the term 'learning style' to identify combined course material and presentations that coincided with particular cognitive styles (Kirby, 1979). In 1979, the National Association of Secondary School Principals (NASSP) accepted a definition presented by Keefe which categorized learning styles as cognitive, affective, and physiological factors that are indicators of how learners perceive, interact with, and respond to a learning environment (Keefe, 1979). Later in 1985, Scarpaci and Fradd developed their own definition of learning styles as ways in which individuals perceive, organize, and recall information in their environment. A few years later, another definition was presented for learning styles as educational conditions under which learners prefer to learn (Stewart & Felicetti, 1992).

While there have been many attempts to define learning styles, there is no agreed upon single, unifying definition (Claxton & Murrell, 1987).

Learning styles researchers are more concerned with the ways in which students prefer to learn than what they actually learn. There are three primary concepts that make up the framework of learning styles: (1) information processing; (2) instructional preference; and (3) learning strategies (Cassidy, 2004). As described by Cassidy, information processing is the intellectual ability of a person to understand the information process. Instructional preference is described as a preferred learning environment for an individual; however, it is difficult to measure the preference.

## **Learning Styles Dimensions**

In 1979, Keefe specified several dimensions of learning styles that were considered to be the most relevant to the improvement of the learning process. These dimensions were: (a) field independence versus dependence (Witkin et al., 1971); (b) perceptual modality preferences (Price, Dunn & Dunn, 1978); (c) conceptual tempo (Kagan, 1966); (d) leveling versus sharpening (Holzman & Klein, 1954); (e) conceptual level (Hunt, 1977; Hunt et al., 1978; Price, Dunn, & Dunn, 1978); (f) locus of control (Rotter, 1971); (g) achievement motivation (McClelland, 1971); (h) social motivation (Hill & Nunnery, 1973); and (i) masculine - feminine behavior (MacCoby & Jacklin, 1974).

### ***Field Independent vs. Dependent***

Founded by Herman Witkin (1962), the field independent versus dependent dimension has been cited as having the greatest potential for the improvement of the educational process (Keefe, 1979; Wooldridge, 1995). Its concept is the most researched of all the learning styles dimensions and deals with learner perceptions. The field independent-dependent dimension reflects learner differences in terms of interpersonal orientation, attention span, competitiveness, and the level of comfort with the structure of the learning environment. For example, field independent/analytical learners do not depend on the environment for reference and cues. Instead, they are able to analyze information and solve problems independently. They appear active, autonomous, and self-motivated in their life approach. They prefer formal learning situations in which teacher is regarded as a source of information. Field-independent learners are competitive, impersonal, and achievement-oriented (Witkin et al., 1971; Witkin et al., 1977; Witkin & Goodenough, 1981). As for field-dependent learners, the organization of the surrounding field controls the mode of perception. In the field dependent mode of perceiving, parts of the field are reflected as separated from the organized ground. Persons who are considered dependent learners depend on the environment of the learning situation for structure. They are interpersonally oriented and depend on

external stimuli. In the learning environment, the teacher is viewed as simply another individual.

### *Perceptual Modality Preferences*

Perceptual modality preferences is a cognitive learning style dimension that measures the learner's preferred ways of understanding and perceiving experiences based on the use of a particular mode of sensory (Keefe, 1979). There are variable sensory modes that individuals can utilize to perceive their environment including visual, aural, kinesthetic, haptic, print, interactive, and olfactory.

Visual learners are those who prefer visual sensory modes to perceive their environment. They are assumed to learn best by visual stimuli such as pictures, graphs, maps, or images, and slides. They perceive information the best through colored depictions and media. According to learning style theory, a visual learner has to look, notice and write in order to obtain the highest level of understanding and mastery (Dunn, 1993; Zapalska & Dabb, 2002).

In a large meta-study, it was found that graphic and tactile display of the subject matter had a great effect on learning outcomes regardless of any trial to match them with learners' modalities (Marzano, 1998). One study discovered that visual display through using pictures was advantageous for adults, regardless of the degree of preference for visual images. It was also particularly beneficial for those who prefer verbal processing (Constantinidou & Baker, 2002).

Auditory learners learn best through listening. They benefit greatly from spoken stimuli and are excellent listeners. They enjoy listening to lectures, talking, and music. They also recall information best when it is spoken/heard during a discussion (Dunn, 1993; Zapalska & Dabb, 2002).

Kinesthetic learners learn best through movement. The human body is naturally built for movement and kinesthetic learners prefer to keep their bodies in motion. Kinesthetic learners process information best when moving their bodies. They like to move their hands and respond to sounds and music through physical movement such as playing or juggling objects. They are not concerned with visual or aural presentations and do not process information effectively when presented information in such formats. Instead, kinesthetic learners learn best in environments where they can be physically involved in the learning process (Dunn, 1993; Zapalska & Dabb, 2002).

Within the kinesthetic realm, individuals exist who learn best by participating in hands-on activities. These individuals are described as haptic learners. They prefer using their sense of touch to learn; therefore, they benefit greatly from activities that require them to work with their hands. They enjoy artwork, piecing things together,

tracing pictures, underlining words as they read, taking notes while listening, and keeping their hands busy; especially if they have low aural preferences (Wooldridge, 1995).

Some individuals learn best through written words. These individuals are classified as having a print modality preference. They prefer reading printed materials and absorb material best while writing and/or reading books. They also prefer to use a board for writing and they have high ability for comprehension.

Individuals who have a preference for interactive modality, learn best through verbalization. They perceive information the best by asking and answering questions during live sessions. They are interactive learners who enjoy talking and having discussions with others and they tend to talk loudly to themselves when studying. They also respect other's views and work well in groups.

Olfactory learners are those who learn best when they incorporate their sense of smell and taste. Unfortunately, there is little information regarding the importance of the olfactory sense among learners even though it has vital implications in learning process. Olfactory learners represent a small group, but they prefer to learn by connecting smells with specific memories and to comparing substances from one another. Such learners are broadly spread throughout the scientific fields such as Chemistry, Botany, and Biology.

### *Conceptual Tempo*

Learning ability differs from person to person. As a result, individuals gain knowledge by perceiving and processing information at different rates based on their personal abilities. Conceptual tempo is a cognitive reflective-impulsive construct. This style recognizes the cognitive modalities used by individuals when problem-solving.

The learners who adopt impulsive rather than reflective constructs prefer to work at a fast pass and reach a decision quickly. Typically, they rush through their work and appear careless. The quick pace in which they work often leads to a task being completed incorrectly (Cruickshank, Metcalf & Jenkins, 2008). Learners who adopt a more reflective than impulsive approach, examine alternative solutions before reaching a final decision. Reflective individuals tend to give logical, accurate responses whereas impulsive learners prefer to give the first answer that comes into mind even it is incorrect (Keefe, 1979).

### *Leveling vs. Sharpening Cognitive Style*

In 1951, Klein conducted a study in an effort to identify differences between learners while they performed simple cognitive tasks. This study led him to identify

two types of learners: the sharpener and the leveler. As learners, sharpeners are those who are able to identify disparities between stimuli with a high degree of accuracy. Levelers, on the other hand, focus on the similarities among stimuli and neglect differences. Levelers also tend to select many memories from the past in an attempt to clarify and categorize newly acquired information leading them to overgeneralize. Sharpeners on the other hand tend to glorify small variations and rely on a few select prior experiences (i.e. memories) when processing new knowledge leading them to overdiscriminate (Keefe, 1979).

Klein's study showed that a learner's cognitive style played a role in his/her overall success due to its effect on the methods employed by learners when perceiving and solving problems. Cognitive style has also been referred to as perceptual attitudes, patterns, predispositions, cognitive attitudes, modes of responses, or cognitive system principles (Gardner, Holzman, Klein, Linton, & Spence, 1959; Holzman & Klein, 1954).

### *Conceptual Level*

Conceptual level is described as a development trait characterizing how much structure a student requires for optimal learning. The conceptual level may be considered as the basis for optimizing the teaching/learning process (Hunt, 1977). Studies have found that when two kinds of information are presented, the students with a low conceptual level are more affected by what they experienced than students with a high conceptual level. Students with a high conceptual level have also shown greater accuracy in personal perception than students with a low conceptual level. (Hunt, 1971; Hunt et al., 1978). Additional factors related to conceptual level are responsibility, the capacity of students to follow through on a task without direct or frequent supervision, the need for structure, and the amount/kind of structure required by different individuals (Keefe, 1979).

### *Locus of Control*

Locus of control as a learning style dimension is concerned with the differences in learner perceptions that lead to specific behavioral outcomes. Locus of control is based on a continuum with internal locus of control on one end and external locus of control on the other end. An individual with internal locus of control sees himself as responsible for his own behavior. It is his/her own individual actions that merit either praise for success or reprove for failure. An individual with external locus of control believes that circumstances such as luck or other individuals are responsible for his/her behavior (Keefe, 1979). Locus of control has been shown to effect student performance (Rotter, 1971). Students who demonstrate an internal locus of control perform better in school, scoring better on tests and reaching higher levels of achievement, than students who demonstrate an external locus of control.

Locus of control has also been tied to achievement among socioeconomic classes. Children of low socioeconomic backgrounds demonstrate behaviors related to external locus of control, believing that forces outside of themselves are responsible for their behavior and the ultimate success and/or failure resulting from said behavior; whereas, children of high socioeconomic backgrounds believe that they have control over their behavior and are responsible for the outcomes resulting from their behavior.

### *Achievement Motivation*

In 1961, David C. McClelland proposed a theory of achievement motivation that related to learning concepts (Gibson, Ivancevich, & Donnelly, 1994). His theory focused on the behaviors that individuals exhibited in order to obtain an internal sense of achievement. Individuals with high achievement motivation perform activities or behaviors not for reward or praise, but simply for the sake of achieving their goals and experiencing a sense of accomplishment. They also set realistic goals that they will be able to fulfill. Before they act, they calculate the likelihood of their ability to successfully perform a particular behavior or action. If they believe that they will be able to successfully perform, then they will set out to achieve the goal(s); otherwise, they will not act and will instead establish more obtainable, realistic goals (Keefe, 1979).

### *Social Motivation*

Social motivation as a learning style dimension measures the beliefs, behavior, and social interactions of an individual or a population. Social motivation is driven by cultural influence. Differences in behavior depend upon the social and ethnic worldviews of an individual or those shared by a population. In this dimension, learners are affected by many factors including, socio-economic backgrounds, culture, and the standards and expectations of their peer groups. Beliefs are confirmed by interactions with others who have similar beliefs and are disconfirmed by interactions with others who do not share the same beliefs (Keefe, 1979).

### *Masculine-Feminine Behavior*

The last dimension is the masculine-feminine behavior dimension. This dimension aims to explain the differences in brain behavior responses between males and females. Research supports evidence that there are differences in behavior that can be attributed to gender. For example, males have been shown to be more aggressive than females. They also have been shown to prefer deductive reasoning whereas females favor inductive reasoning. Also, males are more sensitive to spatial relations and the mathematical processes whereas females tend to relate verbally and have better fine motor control than males (Keefe, 1979).

## Conclusion

Learning styles is a field of research that has many useful implementations for both the learner and educator. Learning styles can be simply understood as the various techniques that students prefer to use to perceive and process information and interact with the learning environment. Identifying the various dimensions of learning styles provides educators with a greater awareness of the unique characteristics of learners. Educators can use this awareness to maximize student learning and support effective education by developing teaching methods that incorporate various learning styles.

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