

## Learning Styles

A lot of research has been done on learning styles. Understanding the learning styles theory and evidence is important in order to:

1. Be aware of differences in how people take in and process information
2. Balance instruction so that all learning styles are addressed at least some of the time

Following is a summary of major learning style theories.

### Kolb Learning Style Theory

The Kolb Learning Style theory considers two dimensions:

1. Concrete experience or abstract conceptualization
2. Active experimentation and reflective observation

Based on those two dimensions, Kolb identifies four types of learning styles:

**Converger** – Abstract and active; good at taking action on the basis of theory. For these learners, application and usefulness of information is increased by understanding detailed information about the system's operation.

**Diverger** – Concrete and reflective; good at reflecting on experience. They like to reason from concrete specific information and to explore what a system has to offer, and they prefer to have information presented to them in a detailed, systematic, reasoned manner.

**Assimilator** – Abstract and reflective; good at developing theory from observation and reflection. They like accurate, organized delivery of information and they tend to respect the knowledge of the expert. They aren't comfortable randomly exploring a system, and they like to get the “right” answer to the problem.

**Accommodator** – Concrete and active; good at putting plans into action to create new experiences. They look for significance in the learning experience and consider what they can do, as well as what others have done previously. These learners are good with complexity and are able to see relationships among aspects of a system.

Source: *Kolb's Learning Style Inventory* (Kolb, D. A. 1984).

## **Felder-Silverman Learning Style**

This model classifies learners on five different dimensions:

**Active and Reflective learners** – Active learners tend to retain and understand information best by doing something active with it – discussing or applying it or explaining it to others. Reflective learners prefer to learn best by thinking things through, working alone.

**Sensing and Intuitive learners** – Sensing learners tend to be more practical and careful, and oriented towards facts and procedures. Also, they tend to be patient with details and good at memorizing facts and doing hands-on work. Intuitive learners are more conceptual and better at grasping new concepts. They tend to work faster and are more innovative than sensors.

**Visual and Verbal learners** – Visual learners learn best if they see visual representations of presented material – pictures, diagrams, flow charts, timelines, films, and demonstrations. Verbal learners learn more from spoken and written explanations. Everyone learns more when information is presented both visually and verbally.

**Sequential and Global learners** – Sequential learners think in linear fashion and work logically in small incremental steps. Global learners, in contrast, are more holistic and system thinkers. They absorb a lot of information in large leaps without seeing the connections.

**Inductive and Deductive learners** – Inductive learners prefer presentations that proceed from specific to general. Deductive learners prefer presentations that move from general to the specifics.

## What kind of learner are you?

The Index of Learning Styles is a self-scoring questionnaire for assessing preferences on four dimensions of the Felder-Silverman model.

**For access to the web-based learning style questionnaire, please visit:**

<http://www2.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/ilsweb.html>

Source: R.M. Felder and L.K. Silverman, *Learning and Teaching Styles in Engineering Education*. *Engr. Education*, 78(7), 674-681 (1988); Barbara A. Soloman and Richard M. Felder, *Index of Learning Styles*.

<http://www.ncsu.edu/felder-public/ILSpage.html>

For explanation of the learning styles, visit:

<http://www2.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm>

Felder's personal website:

<http://www2.ncsu.edu/unity/lockers/users/f/felder/public/RMF.html>

## Howard Gardner

Howard Gardner, a professor of education at Harvard, has identified the following forms of intelligence in learning:

- Verbal-Linguistic – People who learn best by saying and hearing words.
- Musical-Rhythmic – These people learn best through melody and music.
- Logical-Mathematical – These people learn best by classifying information, using abstract thought, and looking for common, basic principles and patterns.
- Visual-Spatial – People who learn best by looking at pictures and watching videos.
- Body-Kinesthetic – These learners prefer activities that provide physical and hands-on experience.
- Intrapersonal – People who learn best by engaging in independent study rather than by working in teams.

- Interpersonal – These people learn best by participating in group activities and discussions, and sharing information.

Source: Gardner, Howard (1983). *Frames of Mind: The Theory of Multiple Intelligences*. For more information on Gardner's theories, visit:

[http://www.edge.org/3rd\\_culture/bios/gardner.html](http://www.edge.org/3rd_culture/bios/gardner.html)

## **Honey and Mumford**

Another model that is widely used in structuring training and education is Honey and Mumford's learning styles. They have identified four different styles in which people prefer to learn:

**Activists** – These people learn best from novel experiences, from being encouraged to have a go and learn through trial and error. They enjoy relatively short learning activities. The activist prefers to learn by doing, to work things out “on the hoof.”

**Reflectors** – These people learn best from observing activities and reflecting on them. They like to collect information and be given time to reflect on it before commenting.

**Theorists** – Learn best from a system, theory, model, or concept. They need conceptual framework to learn effectively. These people need highly structured situations with a clearly defined goal; they like to be able to explore interrelations and question assumptions.

**Pragmatists** – They are interested in what really works, what gives results. They like being exposed to processes and techniques that have immediate relevance to current activities and which they will be able to implement.

Source: <http://www.peterhoney.com>

## **Key Characteristics of Adult Learners**

Malcolm Knowles pioneered the field of adult learning. In his research he has identified the following key characteristics of adult learners:

### **Adults are autonomous and self-directed**

Adults are autonomous and they must feel free to direct themselves. As some researchers mention, "self-directed learning fuels the fire." Therefore, to make the learning effective, trainers should get participants' perspective on what topics should be covered so that the learning process reflects participants' interest. Learning design should also allow for the participants to be actively involved and assume responsibility for presentations and group leadership. Trainers and educators have to act as facilitators, guiding participants through the learning process rather than simply supplying them with the facts.

### **Adults are goal-oriented**

Upon embarking on a new learning opportunity, adults usually have a clearly defined goal they would like to achieve in the process. Most of the adult learners are goal-oriented, and as a result appreciate a training/educational program that will define the specific learning objectives early in the process. Adult learners would like to identify how the training program will help them accomplish their goals.

### **Adults are relevancy-oriented**

In order to spur interest, learning has to be applicable to the work or other responsibilities, which will be of value to the participants in the class.

### **Adults are practical**

Not only are the adult learners relevancy-oriented, they are also practical. They would like to learn only what would have the most significant impact on their day-to-day responsibilities.

### **Adults have accumulated past experience and knowledge**

Adults have accumulated a significant experience/knowledge base through their previous education, family responsibilities, and past experience. They will benefit from the learning process only if they can relate the new information to their past experience and knowledge. To increase the efficiency of the training program, trainers must recognize this and relate new theories and concepts to the participants' previous experience and knowledge.

## **Adults have to feel appreciated and respected**

Adult learners have a lot of experience and knowledge to bring into discussions. They have to be treated equally. They also have to feel respected for the wealth of experience they bring.

Source: <http://www.peterhoney.com/>

## **Myers-Briggs**

Myers-Briggs classifies personalities and learners based on Carl Jung's theory of psychological types – predictable patterns of behavior stemming from differences among people in:

- Preferred domain: Introvert (I) vs. Extrovert (E)
- How people prefer to process information: Sensing (S) vs. Intuitive (N)
- How people prefer to make decisions: Thinking (T) vs. Feeling (F)
- How people prefer to organize their lives: Judgment (J) vs. Perception (P)

The outcome is 16 unique combinations of the above outlined four categories.

### **ESTJ**

The ESTJ takes his/her energy from the outside world of actions and spoken words. He/she prefers dealing with facts and the present, and makes decisions using logic. His/her life is organized on a logical basis. He/she is therefore practical, and likely to implement tried and trusted solutions to practical problems in a businesslike and impersonal manner. He/she prefers to ensure that the details have been taken care of rather than spend time considering concepts and strategies.

### **INFP**

The INFP takes his/her energy from the inner world of thoughts and emotions. He/she prefers dealing with patterns and possibilities, especially for people, and prefers to make decisions on the basis of personal values. His/her life is flexible, following new insights and possibilities as they arise. He/she is quiet and adaptable (up to a point; when his/her values are violated the normally adaptable INFP can surprise people with his/her stance). He/she will seem to be very interested in ideas, and he/she may sometimes make very creative contributions. He/she has hidden warmth for people and a desire to see self and others grow and develop. He/she prefers to undertake work that has a meaningful purpose.

## **ESFP**

The ESFP takes his/her energy from the outside world of actions and spoken words. He/she prefers dealing with facts, which he/she usually takes at face value. He/she also prefers dealing with the present and with people, and probably derives much enjoyment out of friendships. His/her life is flexible, living it very much in the present, and responding to things as they arise. He/she is impulsive and friendly, seeking enjoyment out of life, and makes new friends easily. He/she likes taking part in solving urgent problems, such as fire fighting or trouble-shooting. He/she operates best in practical situations involving people.

## **INTJ**

The INTJ takes his/her energy from the inner world of thoughts (and, maybe, emotions). He/she prefers dealing with patterns and possibilities for the future, and making decisions using impersonal analysis. His/her life is organized on a logical basis. He/she is a strategist, identifying long-term goals and organizing life to meet them. He/she tends to be skeptical and critical, both of self and others, with a keen sense of deficiencies in quality and competence. He/she often has a strong intellect, yet is able to attend to details that are relevant to the strategy.

## **ESFJ**

The ESFJ takes his/her energy from the outer world of actions and spoken words. He/she prefers dealing with facts, and making decisions on the basis of personal values. He/she likes dealing with people, and organizes life on a personal basis. He/she is a very warm person, seeking to maintain harmonious relationships with colleagues and friends, who are a very important part of his/her life. He/she can find conflict and criticism very difficult to handle. He/she has a strong sense of duty and loyalty, and is driven by a need to belong and be of service to people.

## **INTP**

The INTP takes his/her energy from the inner world of thoughts (and, maybe, emotions). He/she prefers dealing with patterns and possibilities, and making decisions on a logical basis. His/her life is flexible, following new insights and possibilities as they arise. He/she is quiet and detached, and adaptable (up to a point; sometimes he/she may stop adapting, insisting that there is a clear principle at stake). He/she is not interested in routine, and will often experiment or change things to see if they can be improved. He/she operates at best when solving complex problems that require the application of intellect.

## **ENFP**

The ENFP takes his/her energy from the outer world of actions and spoken words. He/she prefers dealing with patterns and possibilities, particularly for people, and makes decisions on the basis of personal values. His/her life is flexible, following new insights and possibilities as they arise. He/she is creative and insightful, often seeking to try new ideas that can be of benefit to people. He/she may sometimes neglect details and planning, but he/she enjoys work that involves experimentation and variety, working towards a general goal.

## **ISTJ**

The ISTJ takes his/her energy from the inner world of thoughts (and, maybe, emotions). He/she prefers dealing with facts, and making decisions after considering the various options. He/she organizes his/her life on a logical basis. He/she is quiet, serious, and well prepared for most eventualities. He/she is a keen observer of life, developing a good understanding of situations, which is often not expressed. He/she has a strong sense of practical objectives, and works efficiently to meet them.

## **ESTP**

The ESTP takes his/her energy from the outer world of actions and spoken words. He/she prefers dealing with facts, which he/she usually views objectively, and he/she makes decisions on a logical basis. His/her life is flexible, consisting of a series of activities that interest his/her. He/she is an action-oriented problem solver, and prefers to work with practical organizational issues. He/she can be impulsive, and likes taking part in trouble-shooting-type work. He/she can sometimes neglect follow-through, but will work best when there is a lot going on that needs organizing and solving.

## **INFJ**

The INFJ takes his/her energy from the inner world of thoughts and emotions. He/she prefers dealing with patterns and possibilities, particularly for people, and makes decisions using personal values. His/her life is organized on a personal basis. He/she often has a private sense of purpose in life, and works steadily to fulfill that goal. He/she demonstrates a quiet concern for people, being interested in helping them to develop and grow. He/she is good at developing insight into people, though it can often remain unexpressed.

## **ENFJ**

The ENFJ takes his/her energy from the outer world of actions and spoken words. He/she prefers dealing with patterns and possibilities, particularly for people, and makes decisions using personal values. His/her life is organized on a personal basis, seeking to develop and maintain stable relationships with those

people he/she likes. He/she is actively concerned with promoting personal growth in others. He/she is also highly sociable, and expressive of feelings towards others, but can find conflict and criticism difficult, particularly if it might damage long-term relationships. He/she works best in situations involving people.

### **ISTP**

The ISTP takes his/her energy from the inner world of thoughts (and, maybe, emotions). He/she prefers dealing with facts and making decisions on a logical basis. His/her life is flexible, demonstrating an interest in acquiring new information that leads to a practical understanding of the way the world works. He/she is quiet and detached, and adaptable (up to a point). He/she is often good at solving organizational problems that need to be thought through. He/she is curious about how and why things work, and can seem impulsive, sometimes producing surprising ideas or doing something unpredictable.

### **ENTJ**

The ENTJ takes his/her energy from the outer world of actions and spoken words. He/she prefers dealing with patterns and possibilities, and making decisions after considering the consequences of the various courses of action. His/her life is organized on a logical basis. He/she tends to control life, organizing systems and people to meet task-oriented goals. He/she often takes the role of executive or director, using a business-like and impersonal approach. He/she may appear intolerant of people who do not set high standards for themselves or don't seem to be good at what they do.

### **ISFP**

The ISFP takes his/her energy from the inner world of thoughts and emotions. He/she prefers dealing with facts and people, and making decisions on the basis of personal values. He/she is adaptable (up to a point), quiet, and friendly. He/she is interested in people, enjoying their company preferably on an individual basis or in small numbers. He/she takes a caring and sensitive approach to helping others. He/she enjoys the present, and tends to dislike confrontation and conflict. He/she usually acts as a very supportive member of a team.

### **INTP**

The INTP takes his/her energy from the outer world of actions and spoken words. He/she prefers dealing with patterns and possibilities, and making decisions on a logical basis. He/she is adaptable, tending to focus on new ideas and interests as and when they arise, particularly if they involve increasing his/her competence or skill. He/she is an ingenious problem solver, constantly trying new ideas out, and can seem to enjoy a good argument. He/she is interested in instigating change,

and operates best in overcoming new difficulties where the solution requires the application of creative effort.

## **ISFJ**

The ISFJ takes his/her energy from the inner world of thoughts and emotions. He/she prefers dealing with facts and people, and making decisions on the basis of personal values. His/her life is organized on a personal basis, seeking to enjoy relationships with people he/she likes. He/she is a quiet, serious observer of people, and is both conscientious and loyal. He/she prefers work that involves being of practical service to people. He/she is often concerned for, and perceptive of, how other people feel and dislikes confrontation and conflict.

Source: <http://www.teamtechnology.co.uk>

## **Seven Principles of Learning**

Educators and trainers must remember that learning occurs within each individual as a continuous process throughout life. Learning results from stimulation of the sense, and it is a complicated process. There are seven general principles of learning that educators and trainers have to consider in designing a training session to ensure effective learning process:

### **Learning is fundamentally social**

Although many students and workers in our society expect to maintain distance between work and social activity, the ability to integrate work and learning with the social experience is what makes an adult professional successful. Learning as a process is the most successful when participants relate their learning to what they already know. Learners need to be made to feel a part of the learning process; their stories and real-world connections to the context of the course make it more meaningful to them as learners.

### **Knowledge is integrated in the life of communities**

Knowledge, activity, and social relations are closely interrelated. People seek to gain membership and to actively participate in various communities of practice by sharing their beliefs, values, and ways of doing things. Learning is the process through which people achieve this goal as knowledge underlies the activities and is an integral part of the life of communities. "In communities of practice, social relations form around activities, activities take shape through relationships, and a particular kind of knowledge and expertise become part of the individual's identities and places in the community."

### **Learning is an act of membership**

As learning is the process through which people gain membership in communities of practice, every act of learning changes one's identity and redefines one's position in the community. Learning is the process through which people connect with others. Therefore, learning should not be viewed as just the activity of a sole individual.

### **Knowing is engagement in practice**

Learners need to feel connected to the learning process through communication, and opportunities to give input on perspectives on learning. Shared roles and responsibilities, as well as opportunities to exchange information with others are excellent ways to reinforce learning. This relation builds a powerful connection to learning as participants learn best by doing.

### **Engagement is inseparable from empowerment**

People's ability to contribute defines their identities and positions in the community. Therefore, real-world situations in which people see a meaningful way to contribute, not only to further their personal development but also to improve the life of the community, will offer the greatest opportunity for learning.

### **Learning requires access and opportunity**

Learning that does not provide opportunity for full act of membership and meaningful contribution is not effective. For engaged learning, the participants have to be rewarded by understanding the benefits that the learning process will provide to achieve personal improvement and to help others.

### **We have a society of lifelong learners**

People learn all the time. Learning does not end in the training room; a productive lifelong learner manages to transform any situation into a learning situation. Continuous learning is critical for the career of any professional and for the profitability of any organization.

Source: Institute for Research on Learning.