Editorial Essay

Learning Styles-Do They Matter?

Sidney Groffman, OD, MA, FCOVD, FAAO

Do not train youths to learning by force and harshness, but direct them to it by what amuses their minds so that you may be better able to discover with accuracy the peculiar bent of the genius of each.

Plato

The Heresy

Some time ago I was at a dinner party that consisted mainly of educators. There was a lot of lively conversation covering many topics but eventually it turned to the role of learning styles in teaching. Almost unanimously, all these experienced teachers and I, insisted that learning styles are an important cognitive factor in how individuals learn. Finally, one person who had listened quietly during this animated conversation spoke up and said that recent research has shown that learning styles of students do not matter and he cited a recent article by Daniel Willingham,[1] a leading cognitive scientist. The entire group, including myself, was aghast at this heresy. How dare he question what all of us had been taught in leading institutions of higher learning and practiced for many years? He listened quietly and then gently suggested that we read the article. Well I did and learned quite a lot. But first let's review what we mean by learning styles.

Correspondence regarding this editorial can be e-mailed to groffman@sunyopt.edu or sent to Dr. Sidney Groffman, SUNY State College of Optometry 33 West 42nd Street, New York, NY 1003. All statements are the author's personal opinion and may not reflect the opinions of any institution or organization to which he may be affiliated.

S. Groffman. Learning Styles – Do They Matter. Optom Vis Dev. 2005:36(2):*73-5.*

Learning Styles

So, what is a learning style? An individual's learning style can be defined in many ways, including, "the complex manner in which, and conditions under which, learners most efficiently and effectively perceive, process, store, and recall what they are attempting to learn."[2] Alternatively, learning style can also be "the preference or predisposition of an individual to perceive and process information in a particular way or combination of ways.[3] According to Tanner, Chatman and Allen[4] "from a biological perspective, the brain is the organ of learning, and as such, a learning style is likely to be a complex, emergent, interaction of the neurophysiology of an individual's brain and the unique developmental process that has shaped it through experience and interaction with the environment. Learning style, thus, is a phenotypic characteristic of an organism like any other…learning styles should be considered to be flexible, not immutable…"

There has been a great deal of work on learning styles over the last 40 years. Dunn and Dunn,[5,6] have focused on identifying relevant stimuli that may influence learning. Others[7,8] have recommended varying teaching strategies. Examples of how a teacher can teach the alphabet through four sensory learning modalities include:

Visual: Shows pictures, power point slides, or video of the alphabet.

Auditory: The students sing the alphabet.

Kinesthetic: The students act out the letters.

Tactile: The students trace the letters on chalkboards, flannel boards, in the air, on sandpaper, and on their own bodies.

Classification of learning styles

The theory of learning styles suggests that we learn and process information in different ways. There are many different ways to classify learning styles. These fall into general categories that represent ways to focus on the learner:

1. Sensory modalities
2. Information processing
3. Personality patterns

Sensory modalities define biologically based reactions to our physical environment and basically include the visual, auditory, tactile and kinesthetic senses. Perceptual

modality refers to the primary way our bodies take in information.

Information processing distinguishes between the way we sense, think, solve problems, and remember information. Each of us has a preferred, consistent, distinct way of perceiving, organizing, and retaining information. Optometric visual information processing, developmental and perceptual evaluations provide us with the necessary data to diagnose and provide vision therapy for problems in this area.

Personality patterns focus on attention, emotion, and values. Studying these differences allows us to predict the way people react and feel about different situations. This information can be valuable in assessing and treating our vision therapy patients. It is very often available from school and professional reports. The Myers-Briggs Type Indicator Assessment,[9] adapted from the theories of Carl Jung, is a commonly used test which explores the connection between personality, temperament, and learning style.

Sensory Modalities

Sensory modalities have the most implications in education and possibly behavioral optometry. Visual learners prefer seeing what they are learning. Pictures and images help them understand ideas and information better than explanations. A drawing may help more than verbal explanations. When someone explains something to a visual learner he or she may visualize a mental image of what the person talking describes.

Auditory learners fall into two categories with the more prevalent type being listeners who will most likely do well in school. Out of school, they remember things said to them and make the information their own. They may even carry on mental dialogues and determine how to continue by thinking back on the words of others. The less understood auditory learners, i.e. "talkers," need to hear their own voice to process the information. They often find themselves talking to those around them, and often mutter comments to themselves.

Kinesthetic learners want to sense the position and movement of what they are working on. They want to be actively involved with lots of physical activities. Tactile learners want to touch. Enough talking and looking they may say. "Lets work with this stuff." They like board games, projects, and puzzles. Even if kinesthetic or tactile learners don't get much from the discussion or the written materials they may catch up by working through scenarios and labs. Most assessments group tactile and kinesthetic together, though they mean different things. Their similarity is that both types perceive information through nerve endings in the skin, as well as organs through muscles, tendons, and joints.

Frames of Mind

Howard Gardner, in his provocative book,[10] *Frames of Mind,* established another way of grouping modalities. His approach to defining learning styles stems from the notion that the concept of intelligence has been too narrowly defined. Gardner argues the dominant form of IQ measurement is focused on a singular, unitary concept. He asserts that there are at least eight modalities or intelligences that link to our individual styles.

1. Verbal-linguistic–sensitive to the meaning and order of words
2. Musical–sensitive to pitch, melody, rhythm, and tone
3. Logical-mathematical–able to handle chains of reasoning and recognize patterns and order
4. Spatial–perceive the world accurately and try to re-create or transform aspects of that world
5. Bodily-kinesthetic–able to use the body skillfully and handle objects adroitly
6. Interpersonal–understand people and relationships
7. Intrapersonal–possess access to one's emotional life as a means to understand oneself and others
8. Naturalistic–observation of patterns, identification, and classification

Gardner's concept of diverse modalities has led to therapeutic programs based on his theory that has found some favor with optometrists who use vision therapy.

Does Specific Modality Teaching Work?

A Google search for "learning style" or "learning modalities" reveals over 24 million citations. There is obviously a lot of interest in this area, but the vast majority of the citations are repetitive definitions of learning style, testing devices for determining preferred modalities, many different ideas and theories, teaching techniques, commercial materials for testing and teaching, and some research studies testing the thesis that utilizing learning styles have a positive effect on learning. A meta-analysis by Kavale and Forness[11] of 39 such studies provides substantial evidence that specific modality instruction is not effective. According to Willingham, "children do differ in their abilities with different modalities, but teaching the child in his best modality doesn't affect his educational achievement. What does matter is whether the child is taught in the content's best modality. All students learn more when content drives the modality."

This concept is contrary to the beliefs of most educators and optometrists. Arter and Jenkins[12] reported that more than 90% of

special education teachers believed in the modality theory of teaching. I suspect that most behavioral optometrists (including myself) held the same belief. This is so because it is obvious that individuals do differ in their modality abilities and preferences. We, therefore, tend to believe that we should learn better if we teach to these differences and it offers a hopeful message that it may provide a simple method of improving performance in academics and visual information processing.

A Message for Behavioral Optometry?

I believe that it is important to determine the dominant modality of my patients. I use a combination of standardized tests, history, and observations to make this decision. In my reports to schools I would include a paragraph regarding the patient's dominant modality. Many educators appreciated this and said they incorporated the information in planning a learning program for students. Based on the information in this essay I will no longer report this data routinely. If an educator specifically requests it, I will provide it.

More importantly, I feel we have a significant role to play concerning learning modalities. Even though the evidence is convincing that designing special curriculum material based on styles is not productive, the research shows that all of the modality styles are important in learning. Many of our patients are deficient in not only visual style but in some of the other styles identified by Gardner such as spatial, logical/mathematical, naturalistic, or bodily kinesthetic. These students may have learning difficulties because of these deficit areas. It is our responsibility to identify them and provide specific vision therapy for our patients.

References

1. Willingham DT. Do visual, auditory, and kinesthetic learners need visual, auditory, and kinesthetic instruction? American Educator 2005;29(2):31-5.
2. James WB, Gardner DL. Learning styles: implications for distance learning. New Direction in Adult Continuing Education 1995;67:19-32.
3. Sarasin LC. Learning style perspective: impact in the classroom. Madison, WI: Atwood Publishing,1998.
4. Tanner KD, Chapman ES, Allen DE. Cooperative learning in the science classroom: beyond students working in groups. Cell Biology Education 2003;2:1-5.
5. Dunn R, Dunn K. Teaching elementary students through their individual learning styles. Boston: Allyn and Bacon.1992.
6. Dunn R, Dunn K. Teaching secondary students through their individual learning style. Boston: Allyn and Bacon, 1993.
7. Armstrong T. Seven kinds of smart. New York: Penguin Group, 1993.
8. Vos J, Dryden G. The learning revolution. Torrance, CA: Jalmar Press,1994.
9. Myers IB, McCauley MH. Manual: A guide to the development and use of the Myers-Briggs Type Indicator, 2nd ed. Palo Alto, CA: Consulting Psychologists Press, 1986.
10. Gardner H. Frames of mind: the theory of multiple intelligences. New York: Basic Books, 1993.
11. Kavale KA, Forness SR. Substance over style: Assessing the efficacy of modality testing and teaching. Exceptional Children 1987;54(3):228-39.
12. Arter JA, Jenkins JA. Differential diagnosis-prescriptive teaching: A critical appraisal. Rev Ed Res 1979;49:517-55.