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ABSTRACT

Research shows that student motivation and performance improves when instruction is adapted to student learning preferences and styles. Educators have a responsibility to understand the diversity of their students and to present information in a variety of ways in order to accommodate all learners' preferences. Several learning styles theories have been proposed over the past 30 years, all of which concur on the diversity of learners and the need to address diversity in classroom instruction to improve student performance. The models include: the Theory of Multiple Intelligences, a cognitive model which suggests that each person possesses several intelligences; the Myers-Briggs Type Indicator, which measures the affective dimension of learning and is based on the work of Jung; the Visual-Auditory-Kinesthetic Model, which focuses on the modes or senses through which people take in and process information; the VARK Learning Styles Inventory, which provides a perceptual learning style profile for each student; the Modality Strengths Model, which attests that observable modality strengths are more important in planning instruction than learners' modality preferences; and the Learning Styles Inventory, which encompasses instructional environment, emotionality, social preferences, and physiological uniqueness. (Contains 22 bibliographic references.) (SM)

# Research Report

## Learning Styles: The Multimedia of the Mind

"If individuals have significantly different learning styles -- as they appear to have -- is it not unprofessional, irresponsible, and immoral to teach all students the same lesson in the same way without identifying their unique strengths and then providing responsive instruction?"

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January 2001

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## Learning Styles:

### The Multimedia of the Mind

#### How Should Students Learn?

What should students learn? A subject of much debate is the breadth (mile long) and depth (inch deep) of public education -- the quantity versus quality of education in the United States. A second question that, when answered, would have a significant impact on the quality of education in the United States is **HOW** should students learn?

#### Learning Styles Theories

Several learning styles theories have been proposed over the last thirty years in which learning styles have been categorized, defined, and analyzed. While all of the models discussed here vary in their methodology, they all concur on the diversity of learners and the need to address that diversity in classroom instruction to improve student performance. But, which theory is the "right" one? The answer may very well be ALL of them, as each model touches on a different aspect of the whole learner (Armstrong 1994). The human mind is a complex organism. In our efforts to understand the way the mind works, we should approach it from all angles -- information processing, personality, and perceptions -- the multimedia of the mind.

Educational researchers have proposed several learning styles theories since the 1970s, the most familiar of which is probably Howard Gardner's Theory of Multiple Intelligences (MI). In his book, Frames of Mind: The Theory of Multiple Intelligences, Gardner describes seven separate intelligences, including linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal. MI theory is a cognitive model, at the core of which is the belief that (1) each person possesses all seven intelligences, (2)

most people can develop each intelligence to an adequate level of competency, (3) intelligences usually work together in complex ways, and (4) there are many ways to be intelligent within each category (Armstrong 1994). In Gardner's own words, the essence of the theory is "to respect the many differences among people, the multiple variations in the ways that they learn, the several modes by which they can be assessed, and the almost infinite number of ways in which they can leave a mark on the world" (Armstrong 1994, p. vii).

Another well-known learning styles model is the Myers-Briggs Type Indicator (MBTI), which measures the affective dimension of learning and is based on the work of Carl Jung. Bettina Lankard Brown (1996) states that "personality sets the stage for how one acquires and integrates information. It reflects genetic influences as well as the influences of culture, environment, and experiences" (p. 4). The MBTI categorizes individuals into 16 different types of personalities, or archetypes, based on the way they view their environment, make decisions, focus on the inner world of ideas and concepts or the outer world of people and things, and respond to situations with acceptance or judgmental attitude (Wilson 1998). The MBTI test is intended for adults and has been in use for more than fifty years. A second model emphasizing personality is Herman Witkin's Bipolar Construct of Field Dependence and Field Independence, which measures the extent to which the learner is influenced by a surrounding field (Brown 1996). Asselin and Mooney (1996) use brain hemisphericity to differentiate between right brain (global) and left brain (analytic) learners. In general, "those who are field dependent or 'global' perceive things as a whole, make broad general distinctions among concepts. Are people-oriented, and learn material in a social context. Those who are field independent or 'analytic' perceive things in parts rather than as a whole, impose structure or restrictions on information and concepts, see little overlap, and have an impersonal relationship to the world" (Wilson 1998, p. 4).

The Visual-Auditory-Kinesthetic (Modality Preference) Model focuses on the modes or senses through which people take in and process information (Willis 1999). It is a perceptual, instructional preference model that categorizes learning by sensory preferences. Bettina

Lankard Brown (1996) states that "learning styles research shows that most people prefer learning by experiencing and doing (kinesthetic elements), especially when reinforced through touching and movement (tactile elements)" (p. 3). A study done by Specific Diagnostic Studies concludes that 29% of elementary and high school students learn best through the visual mode (pictures), 34% through the auditory mode (sound or music), and 37% through the tactile/kinesthetic mode (moving, touching, doing) (Willis 1999). Swanson (1995) reports that "sensory preferences are also distinguishable among different cultural groups" (p. 10). An instrument used to assess sensory preferences is the Multi-Modal Paired Associates Learning Test (MMPALT).

A second instrument used to identify modality preferences is the VARK Learning Styles Inventory. The VARK Learning Styles Inventory provides a perceptual learning style profile for each student. The acronym VARK stands for the Visual, Aural, Read/write, and Kinesthetic sensory modalities used in learning. The VARK Inventory was developed in 1987 by Neil Fleming, Lincoln University, New Zealand. It differs from most learning styles instruments in that it's primary purpose is to be advisory rather than diagnostic and predictive. Fleming added a fourth category, read-write, to the visual, aural and kinesthetic characteristics used by most researchers to define perceptual learning styles by subdividing the visual mode into symbols (visual) and text (read-write). The inventory has "received high acclaim from students and professors for its powerful simplicity, its ability to spark discussion about learning and the fact that it makes intuitive good sense" ([www.active-learning-site.com](http://www.active-learning-site.com)).

The Modality Strengths Model introduced by Walter Barbe, Michael Milone, and Raymond Swassing attests that "observable modality strengths (the superior functioning of visual, auditory, and kinesthetic channels of learning) are more important in planning instruction than learners' modality preferences, which may or may not match their strengths" (Wilson 1998, p. 9). This perceptual model suggests that modality strengths are not fixed, changing over time. Mariaemma Willis, author of *Discover Your Child's Learning Style*, states that "there are different ways to express each modality ... each person's

set of modality strengths is unique, and may even differ with the situation or learning activity" (Willis 1999, p. 144). Barbe, Milone, and Swassing believe that matching students with teachers of similar modality strengths enhances motivation and achievement (Wilson 1998). "Their research, completed in the late 1970s, showed that students vary in respect to their modality strengths, with about 30% visual, 30% mixed, 25% auditory, and 15% kinesthetic ... They found no difference between the races or sexes on modality strength" (Wilson 1998, p. 9). Other studies have found that "students whose styles are matched with those of their teachers report greater ease of learning (Packer and Bain 1978) and higher satisfaction (Renninger and Synder 1983) than those whose styles are mismatched" (Wilson 1998, p. 3).

The Learning Styles Inventory developed by Dunn and Dunn is the most widely used learning styles instrument in elementary and secondary schools (Wilson 1998). The LSI encompasses four areas: (1) instructional environment, (2) emotionality, (3) social preferences, and (4) physiological uniqueness (perceptual preferences ... auditory, visual, tactile, and kinesthetic).

## Styles-Based Education: The Consensus

In reviewing the literature, there appears to be a consensus about the need to improve student learning through active involvement and instruction that recognizes the diversity of learning styles:

- People's learning styles are unique and permanent, they transcend socio-economic lines, and are not measurements of intelligence (Vail 1992).
- Each person has more than one way of learning. Most of us have predominant clusters, preferred channels, and secondary, subordinate approaches (Vail 1992).
- Children seem to begin showing 'proclivities', or inclinations, in specific intelligences from a very early age (Armstrong 1994).
- Cultural patterns in learning styles do exist (Brown 1996).
- Just as students have different learning styles, teachers have distinctive teaching styles (Vail 1992).

- Both achievement and motivation improve when learning and teaching styles are matched (Wilson 1998).
- We need to stop drawing attention to what kids can't do and start emphasizing what they can do (Willis 1999).
- Schools are learning-style biased: they teach mainly to one type of learner (Willis 1999).
- To realize their intellectual capacity, students must become engaged in learning, stimulated by information that is presented to them in personally meaningful ways (Brown 1996).
- Students learn best through direct actual experience, cooperation and collaboration, and high levels of interaction (O'Neil 1990).
- Both the quality and quantity of learning increase when a student is enjoying the process (Willis 1999).
- The brain tends to discard information for which it finds no connection or meaning or for which the meaning is obscure (Parnell 1996).

### Styles-Based Education: The Critics

Why do students learn? Critics of Learning Styles Theory remain unconvinced of the benefits of styles-based instruction, despite the large body of research that suggests otherwise. It is their assertion that the active involvement and interest of teachers, regardless of methodology, affect student motivation and learning. Gregorc states: 'My contention is that one of the reasons that some of these scores are going up ... is that the kids sense that someone cares'. (O'Neil 1990, p. 7)

### In Conclusion

In order to provide our students with the best possible educational experience, we must carefully consider both content and context in curriculum development. An important consideration too often overlooked is the diversity of learners and the implications for instructional design. Far too often, the emphasis is placed on the assessment of learning disabilities rather than that of learning abilities.

Extensive research over the past four decades has shown that student motivation and performance improves when instruction is adapted to the learning preferences of students. In light of such evidence, educators have a responsibility to understand the diversity of their students and to present information in a variety of ways in order to accommodate all learners' preferences.



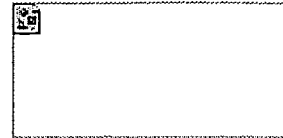
## BIBLIOGRAPHY

- Armstrong, Thomas, Multiple Intelligences in the Classroom, Association for Supervision and Curriculum Development, Alexandria, VA, 1994
- Asselin, S.B. and M. Mooney, "Diverse Learners: Strategies for Success," Virginia Vocational Curriculum and Resource Center, Glen Allen, VA, 1996 (ED406529)
- Brown, Bettina Lankard, "Learning Styles and Vocational Education Practice", U.S. Department of Education, Office of Educational Research and Improvement, Practice Application Briefs, 1996
- Fallows, Stephen and Kemal Ahmet, Inspiring Students: Case Studies in Motivating the Learner, Staff and Educational Development Series, Kogan Page Limited, London, 1999
- Guild, P.B. and S. Garger, Marching to Different Drummers, Association for Supervision and Curriculum Development, Alexandria, VA, 1985
- Halpern, Diane F., Changing College Classrooms: New Teaching and Learning Strategies for an Increasingly Complex World, Jossey-Bass Publishers, San Francisco, CA, 1994
- Jasmine, Julie, Teaching with Multiple Intelligences, Teacher Crafted Materials, Westminster, CA, 1996
- Levine, Melvyn D. , M.D., All Kinds of Minds, Educators Publishing Service, Inc., Cambridge and Toronto, 1993
- McKeachie, Wilbert J., McKeachie's Teaching Tips: Strategies, Research, and Theory for College and University Teachers, Tenth Edition, Houghton Mifflin Company, Boston and New York, 1999
- National Education Association of the United States, Multiple Intelligences, NEA Professional Library, Teacher to Teacher Series, 1996
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- O'Neil, J., "Making Sense of Style," Educational Leadership 48(2), 4-9, 1990
- Packer, J. and J.D. Bain, "Cognitive Style and Teacher-Student Compatability," Journal of Educational Psychology 70, 864-871, 1978
- Parnell, D., "Cerebral Context," Vocational Education Journal 74(3), 15-21, 30, May 1996
- Renninger, K.A. and S.S. Synder, "Effects of Cognitive Style on Perceived Satisfaction and Performance Among Students and Teachers", Journal of Educational Psychology 75(5), 668-676, 1983
- Silberman, Mel, Active Learning: 101 Strategies to Teach Any Subject, Allyn and Bacon, A Simon and Schuster Company, Needham Heights, MA, 1996
- Swanson, L.J., "Learning Styles: A Review of the Literature," U.S. Department of Education, Educational Resource Information Center, July 1995 (ED387067)
- Theall, Michael, Motivation From Within: Approaches for Encouraging Faculty and Students to Excel, New Directions for Teaching and Learning, Number 78, Jossey-Bass Publishers, San Francisco, CA, Summer 1999
- Tobias, Cynthia Ulrich, The Way They Learn, Word Books, Dallas, TX, 1994
- U.S. Congress, Office of Technology Assessment, Power On! New Tools for Teaching and Learning, OTA-SET379, Washington D.C., U.S. Government Printing Office, September 1988
- Vail, Priscilla L., Learning Styles: Food For Thought & 130 Practical Tips for Teachers K-4, Modern Learning Press, Rosemont, NJ, 1992
- Willis, Mariaemma and Victoria Kindle Hodson, Discover Your Child's Learning Style, Prima Publishing, 1999
- Wilson, Vicki A., "Learning How They Learn: A Review of the Literature on Learning Styles," U.S. Department of Education, Educational Resource Information Center, 1998 (ED427017)



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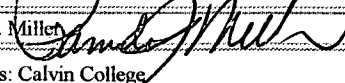
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