

Appendix M

The Application of Brain Dominance Technology to the Training Profession*



Much has been said and written about the brain in recent years that has potentially significant implications for people involved in education and training. Why should this subject be of interest to HRD professionals? Simply stated, the brain is involved in all aspects of the learning process. It is the single body organ that is the central processor of all learning activities.

Contemporary understanding of human brain functions establishes that each brain is unique and that brains in general are specialized. While experts argue about the degree of specialization, there is general agreement on the fact of specialization. There is also agreement on the concept of dominance: eye dominance, hand dominance, foot dominance, ear dominance, and brain dominance. While the body is symmetrical in terms of organ duality (that is, humans have two eyes, two ears, two hands, two feet and two hemispheres), experts agree that in the use of these dual organs there exists a general asymmetry. In other words, we use one to a greater degree than the other. When combined, the concepts of specialization and asymmetry or dominance produce within each human being a distribution of specialized preferences that

* Adapted by the author from Herrmann, Ned, "Brain Dominance Technology," in Craig, R. L., *TRAINING AND DEVELOPMENT HANDBOOK*, 3rd ed., New York: McGraw-Hill, © 1987 by McGraw-Hill, Inc., pp. 349-358. Reprinted by permission of the author and the publisher.

affect general behavior. Specifically included is the unique individual's learning style.

An immediate implication for the education and training profession is that the assumptions about the learner must now be completely reconsidered. Intelligence is no longer one-dimensional, but rather includes the notion of multiple intelligences. Each individual is now being thought of as a unique learner with learning preferences and avoidances different from other learners. This means that learning designs must somehow factor in the uniqueness of the individual learner so that the subject matter is understood by all the participants in the learning experience, not only equally in terms of comprehension, but also consistent in terms of intended meaning.

Each one of us, as an HRD professional, is also a unique human being with a unique learning style. If we consider our own experience throughout our personal learning history, the face validity of these concepts would likely be strongly substantiated. Most of us did much better in some subjects than we did in others. We responded much more to some teaching methods than others. We retained some material more accurately and for a longer time than other material delivered in a different way. We remember the three or four outstanding teachers and we have forgotten many others who for us were not effective. The reason for that is your personal uniqueness and individual learning style that differentiates you from others in terms of content, delivery, learning environment, and teaching techniques.

The Concept of Whole Brain Teaching and Learning provides the basis for bridging the gap between the unique individual learner and the design and delivery of the learning. The reason that HRD professionals who have made use of whole brain teaching and learning concepts are so enthusiastic about this approach is that it works effectively for a much larger population of learners in a much wider variety of subject areas, involving a broad cross section of course leaders.

The concept works because:

- The brain is specialized.
- Individual brains are unique.
- The brain is situational.
- Learning is mental.
- Unique individuals have different learning styles.
- Learning designs can accommodate individual differences.
- Delivery of learning can respond to personal uniqueness.
- Unique people can be made an integral part of the learning design.
- Learners can be grouped to make the learning more effective.

- Learning through affirmation and discovery can be more effective, fulfilling, enjoyable, and last longer.
- Learning programs that are based on the specialized brains of unique participants work to the advantage of everyone—including the trainer.

The brain is comprised of a wide array of specialized functions. Many of these specialized modes are allocated to specific locations in the two hemispheres. Even though in some instances the degree of lateralization between the left and right hemisphere is relatively small, the effect of dominance causes the differentiation to be very large. Therefore, from a practical point of view none of these specialized modes can be ignored when it comes to the unique person in a learning situation. It is far better to assume that specialization exists than to rationalize that it is too small to matter. Experience with thousands of learners in workshops, where such differences are made visible, is clearly showing that to pay attention to these differences is highly beneficial to the individual learner and also to the entire learning group.

The concept of Whole Brain Teaching and Learning is based upon a distribution of specialized modes throughout the brain system. The model that has been developed divides the brain into four separate quadrants, each one different and equal in importance. Two of these quadrants represent the more cognitive, intellectual modes, associated with the two cerebral hemispheres. The other two quadrants represent the more visceral, emotional modes associated with the limbic system. Two of the four quadrants are specialized in left mode thinking processes. These are the more logical, analytic, quantitative, and fact-based modes contained in the cerebral left quadrant, and the more planned, organized, detailed, and sequential mode processed in the limbic left quadrant. In contrast, the other two quadrants make up right-mode specialization. These include the more synthesizing, integrating, holistic, and intuitive modes, associated with the cerebral right quadrant, and the interpersonal, emotional, kinesthetic, and feeling modes associated with the right limbic quadrant. (See Figure M-1.)

The brain is physiologically composed of two separate hemispheres, which are known as the left and right hemispheres. Contained within the brain halves are two sets of major structures which are connected together (Figure M-2). These include the two cerebral hemispheres connected by the corpus callosum, and the two halves of the limbic system, connected together by the hippocampal commissure. These structures represent massive connections that allow for direct interaction between the two halves of the cerebral system and the two halves of the limbic system.

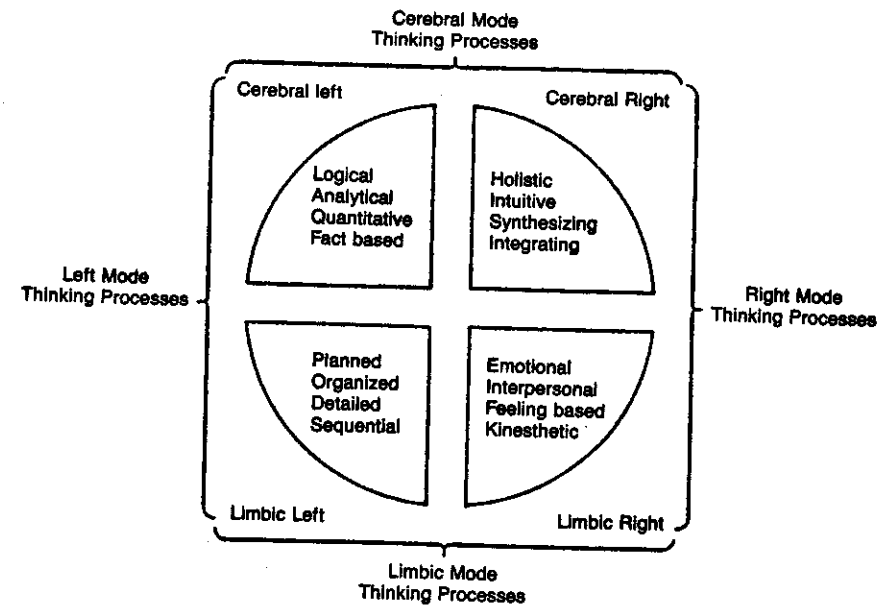


Figure M-1. The thinking process.

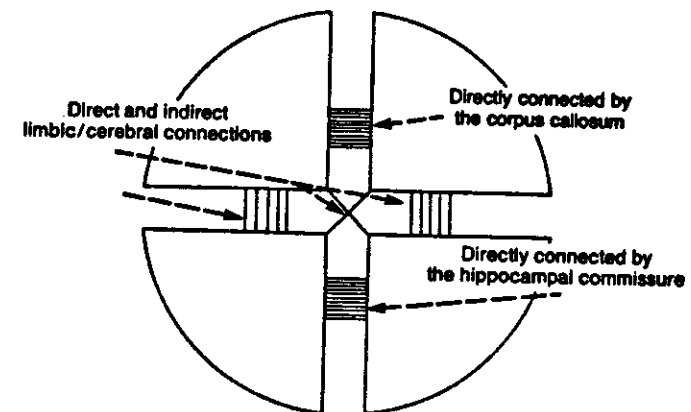


Figure M-2. The interconnected brain system.

We know a lot more about the function of the two cerebral hemispheres than we do about the function of the limbic system, however, more and more understanding emerges each day about both of these specialized areas. While the cerebral hemispheres are thought of as the more cognitive, intellectual parts of the process, the limbic system is becoming known as the more organized and emotional aspect of learning. A key function of the limbic system is to transform information as it is input into the brain system, so as to position it for appropriate processing. By reason of this role, the limbic system has a major effect on memory. There are many who believed that memory is essential to learning, and that indeed, without memory, learning is not possible. Therefore, by reason of the organized and structured aspect of limbic processing, plus its role as the emotional processor, these two quadrants of the teaching and learning model represent a significant aspect of the learning process.

With the sponsorship and funding of General Electric Company, the author was able to develop and validate an instrument to aid in measuring an individual's preferred mode of thinking. This tool is called the "Herrmann Brain Dominance Instrument" (Figure M-3). It is a paper and pencil questionnaire that provides the basis of a personal profile. This profile represents a metaphor of an individual's thinking preferences across the total spectrum of mental options that comprise the four

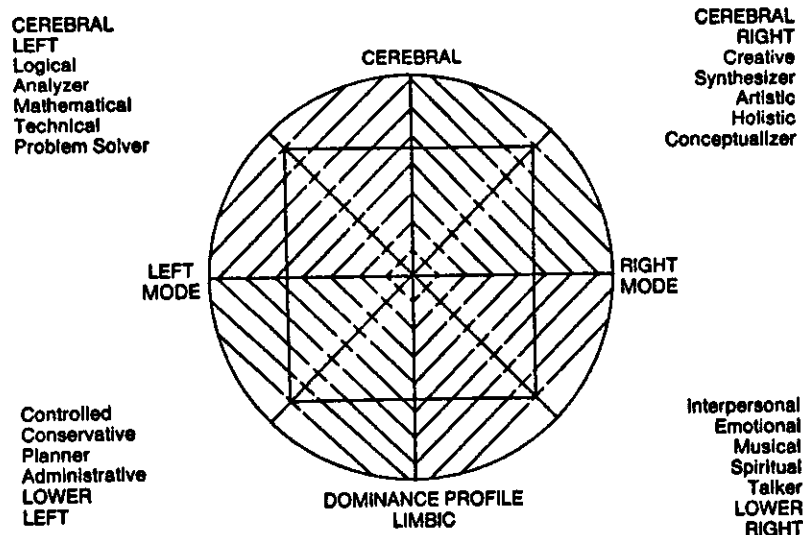


Figure M-3. The brain dominance profile.

parts of the brain described in the Whole Brain Teaching and Learning Model. As of January 1986, close to 200,000 people had completed this instrument. A study of 15,000 participants in a variety of workshops shows a relatively equal even distribution of preferences across all four quadrants. Therefore, considering the world at large, the assumption for trainers must be that people are equally distributed throughout the teaching and learning model in terms of their mental preferences.

Figure M-4 shows the differences in the learning styles represented by the specialized modes of each of the four quadrants. Experience has shown that different design and delivery approaches facilitate learning in each of these four specialized quadrants. Figure M-5 shows these four different design and delivery approaches.

Cerebral left LEARNS BY: —Thinking through ideas —Values logical thinking —Needs facts —Forms theories Builds cases	Cerebral right LEARNS BY: —Self-discovery —Constructs concepts —Values initiative —Is concerned with hidden possibilities
Limbic left LEARNS BY: —Testing theories —Values structure and process —Oriented to skill attainment through practice	Limbic right LEARNS BY: —Listening and sharing ideas —Values intuitive thinking —Works for harmony —Integrates experience with self

Figure M-4. Learning styles represented by the specialized modes of the four quadrants.

Cerebral left Formalized lecture, data-based, case discussions, textbook, program learning, and behavior modification	Cerebral right Nonstructured, experiential, experimental, visual, aesthetic, individual, and involved
Limbic left Structured, sequential, lecture, textbook, organizational case discussions, program learning, and behavior modification	Limbic right Experiential, sensory movement oriented, musical, people-oriented case discussions, and group-interactive

Figure M-5. Design and delivery approaches for the specialized modes of the four quadrants.

Brain dominance data indicate that individuals in similar occupations tend to have the same general profile, therefore, accountants in one division of a company have profiles similar to accountants in another division of the same company. The same is true comparing accountants in one company to accountants in another company. It is also true when comparing accountants in a company in India to accountants in companies in Stockholm, N.Y. City, Johannesburg, and Singapore. It is clearly evident that work is a common denominator of mental preference, not only between companies, but also between cultures.

Figure M-6 shows a sample distribution of brain dominance profiles of selected occupations. Note that some occupations are primarily focused in one quadrant, while others represent multiple dominances in two, three, or even four quadrants. These distributions of preferences by occupation represent a significant issue for training and development professionals as they design and deliver learning programs to people in these occupational groups.

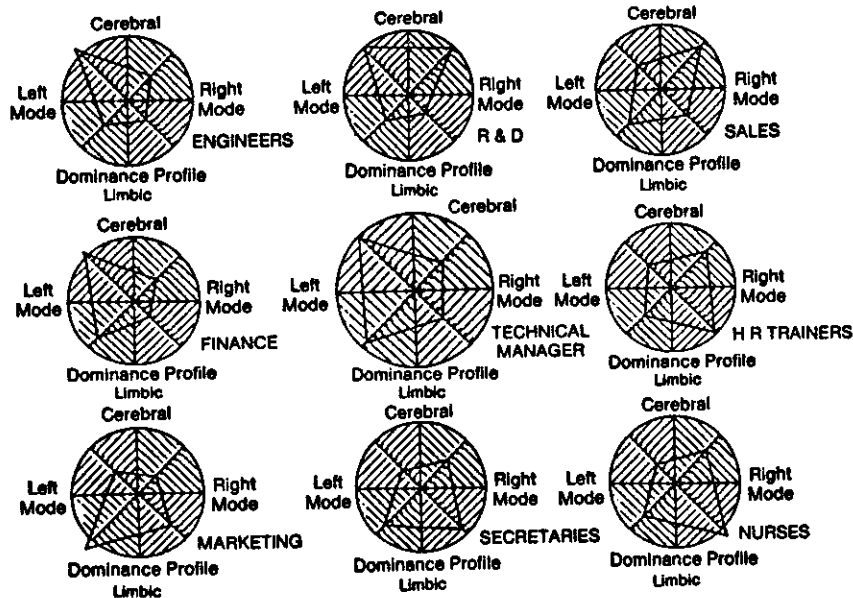


Figure M-6. Brain dominance profiles in selected occupations.

Experience has shown conclusively that there is a strong and direct correlation between a person's personal profile, their occupational profile, and their learning profile. The array of learning profiles, when correlated with the four quadrant brain dominance concept, provides the bases for the creation of a Whole Brain Teaching and Learning Model. Incorporated into the metaphoric model are key descriptors that differentiate each quadrant from the others in terms of major teaching and learning modes, procedures, and processes. The arrows in Figure M-7 indicate the iterative nature of the process as it correlates with the physiology of the interconnected brain.

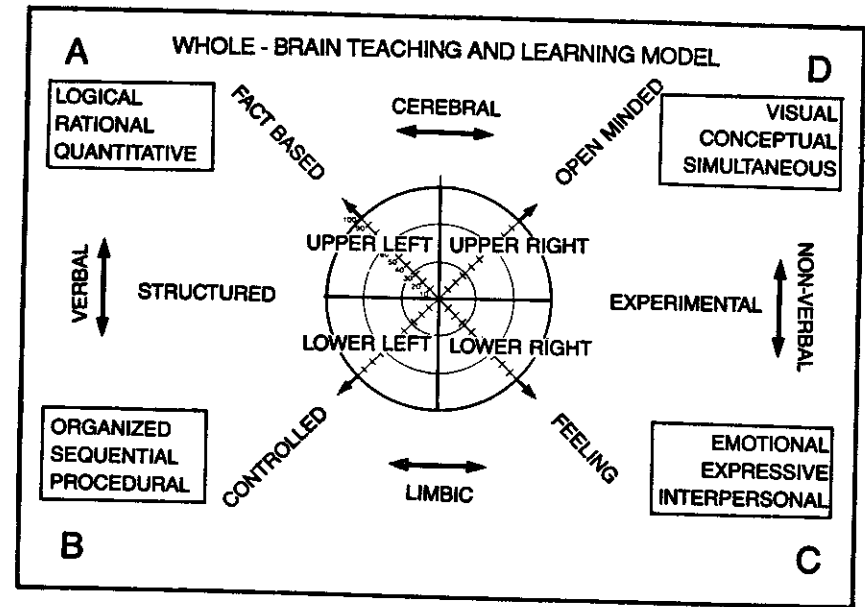


Figure M-7. The whole-brain teaching and learning model.

It is essential to consider the uniqueness of the learning group when designing educational programs for that group. With the use of the model as a diagnostic tool it is possible to gain critical understanding of the preferences of a particular occupational group or organization so as to better design the learning program to meet that unique requirement.

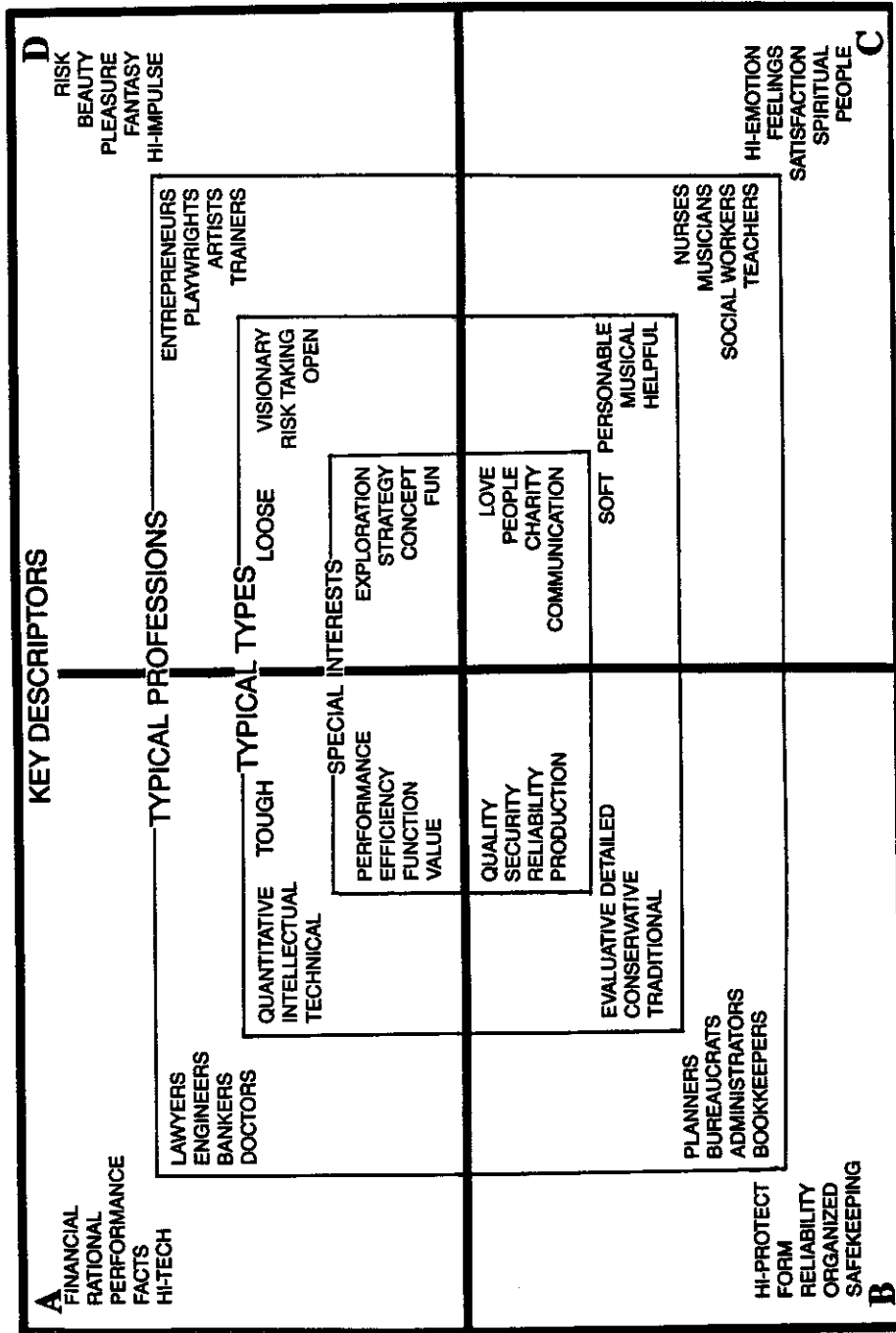


Figure M-8. Learner interest factors.

Direct experience with several specific workshops involving the participation of several thousand people clearly indicates that the most successful approach to learning, design, and delivery is to create a “whole brain” experience for a “composite whole brain” learning group. This is done by designing the learning experience to dynamically move back and forth in its delivery of each key learning point in order to equally distribute the learning across all four quadrants of the model.

Moving back and forth helps ensure that participants with different interests are able to learn effectively and consistently. The nature and extent of these different interests are summarized in Figure M-8.

Shown are:

- Key descriptors of each quadrant of the Whole Brain Model.
- Typical professions that have strong preferences in those quadrants.
- Typical type of individuals that choose those professions.
- Examples of specialized areas of interest of those individuals.

When the unique learning styles associated with each quadrant are added to these profound differences, it becomes clear that traditional approaches to design and delivery frequently fall short of desired results when dealing with a composite group.