Training With The Brain In Mind:
The application of brain dominance technology to teaching and learning

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Training 2002 Session Number 509

This article is provided as background and supplementary information about Whole Brain Teaching And Learning. A paper handout for the presentation will be provided at the session, or available at our booth #2945. Key slides and handouts from the presentation will also be available at:
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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 teachers and trainers? 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.

What does the Brain have to do with Learning?

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 of dominance produce within each human being a distribution of specialized preferences that affect general behavior. Specifically included is the individual's unique
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" as Howard Gardner describes it. Each individual is now being thought of as a unique learner with learning preferences different from other learners. This means that learning designs must somehow factor in the uniqueness of the individual learner. This way, the subject matter will be equally understood by all the participants in the learning experience, not only in terms of comprehension, but also in terms of intended meaning.

It's not what we learn but how we learn it.

Each one of us, as a teacher or trainer, 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. We 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 period of time than other material delivered in a different way. We remember the three or four teachers we found "outstanding" and we have forgotten many others who were not effective for us. The reason for these differences, for you and for most others, is your personal uniqueness and individual learning style that differentiates you from others. The way we react to content, delivery, learning environment, and teaching techniques will all be impacted by our unique learning style.

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 professionals who have use whole brain

teaching and learning concepts are so enthusiastic about this approach, is that it works effectively for a large population of learners in a wide variety of subject areas, involving a broad spectrum of teachers/trainers. Why? The following key characteristics of brain based learning help explain:

- Learning is mental---it comes from the brain
- The learner's brain is unique, specialized and situational
- Unique individuals have different learning styles
- Delivery of learning can be designed to 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

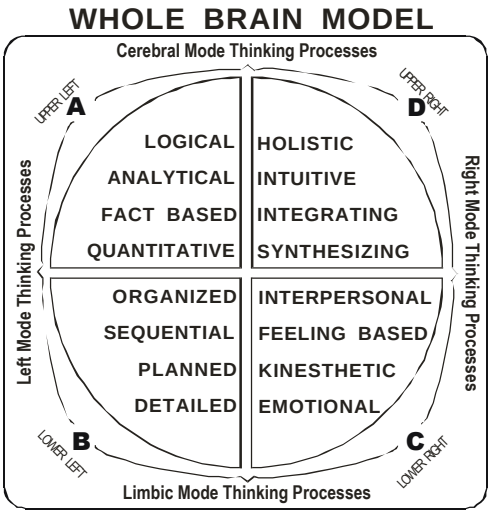
Whole Brain Learning programs are designed based on the specialized brains of unique participants: they work to the advantage of everyone - the learner, the sponsor, and also the teacher/trainer.

"It is far better to assume that specialization exists than to rationalize that it is too small to matter."

Impact of Dominance

Ongoing brain research shows that 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. 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.

Our brain dominance increases the impact of these different specialized modes. Consider Marguerite whose unique learning style, a result of her brain dominance, led her to prefer a highly structured learning designs including step by step instructions and built in practice segments. Attending a certification program with a trainer who focused exclusively on providing a flexible discovery had a strong distaste for step-by-step approaches Marguerite was soon overheated with frustration, trying to figure out "where they were" and began "checking out" from the course. Has this ever happened to you? Experience with thousands of learners in workshops clearly demonstrates that when such differences are made visible *and* are recognized by the teacher trainer the resulting approach, a *whole-brained approach,* is highly beneficial to the individual learner and also to the entire learning group.



Understanding Whole Brain Thinking and Learning.

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 (A and D), associated with the two *upper* cerebral hemispheres. The other two quadrants (B and C) represent the more visceral, emotional modes associated with the *lower* limbic system. The two *left* quadrants are specialized in left-mode thinking processes: logical, analytic, quantitative and fact based modes in the Upper Left A quadrant, and the more planned, organized, detailed and sequential mode processed in the Lower Left B

quadrant. In contrast, the other two *right* quadrants make up right-mode specialization: more synthesizing, integrating, holistic, and intuitive modes the Upper Right D quadrant, and the interpersonal, emotional, kinesthetic and feeling modes associated with the Lower Right C quadrant.

If you think of each of these quadrants as four different people learning how to drive a car., imagine how each might approach process. A-Allan would want to relish the technical aspects of driving, would be very comfortable with the mechanical issues and would approach the challenge quite logically. Ms. B-Barb on the other hand would be ready and organized, enjoying the steps as they progressed: sit in the vehicle, adjust your mirrors, attach your seat belt etc.. Mr. C-Carl would be thinking about the fun he will have with his friends and spend time talking and chatting throughout the whole lesson Ms. D-Deb is imagining the freedom she will have, the places she will see and experience and doesn't seem too worried about the procedures. A driving instructor may have all four of these students, and certainly may prefer teaching one or more over others. Fortunately, we are not limited to a one quadrant perspective, but are "hard wired to be whole."

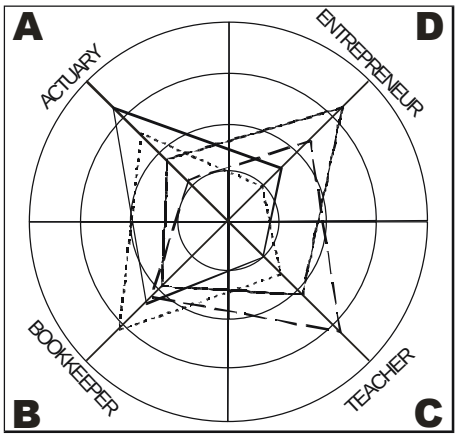
There is "wiring" that crosses the center of our brain connecting the upper quadrants together and lower quadrants together. The corpus collosum (for the upper mode), and the hippocampal commissure (for the lower modes) represent massive connections that allow for direct interaction between these specialized areas. We know a lot more about the function of the two cerebral hemispheres (A and D) than we do about the function of the limbic system, however, more and more understanding about both of these specialized areas emerges each day. While the cerebral hemispheres are thought of as the more cognitive, intellectual parts of the process, the limbic system is known more as the organized and "emotional intelligence" aspect of learning.

A key function of the limbic system is to transform information as it comes up 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 believe that memory is essential to learning and that indeed without memory, learning is not possible. Therefore, by reason of the organized and the emotional processor, these two quadrants B and C of the teaching and learning model represent a significant aspect of the learning process.

Measuring Thinking and Learning Styles

The ability to measure different thinking and learning styles provides the teacher/trainer a distinct opportunity to understand the styles of the students they teach. One way to measure these styles is through the use of an assessment tool. Many assessments exist in the marketplace. Our research has used the HBDI (Herrmann Brain Dominance Instrument) which is an instrument designed to measure an individual's preferred mode of thinking. With the sponsorship and funding of GE, the HBDI was developed and extensively validated. It is a paper and pencil/online questionnaire that provides a personal profile representing a metaphor of that individual's thinking preferences.

Sample occupational profiles



Those preferences cross the total spectrum of mental options that comprise the four parts of the brain described in the Whole Brain Model. To date, close to 1 million individuals have been profiled and of thousands of participants in a

variety of workshops show an equal distribution of preferences across all four quadrants, both here in the US and around the world. Therefore, considering the world at large, our assumption must be that people learning preferences are equally distributed throughout the teaching and learning model.

The following model exhibits the differences in learning styles represented by the specialized modes of each of the four quadrants.

Design & Delivery Approaches for the
Specialized Modes of the 4 Quadrants

Upper Left A **Learns By:** •Acquiring & Quantifying facts •Analysis & Logic •Thinking Through Ideas •Building Cases •Forming Theories	**Upper Right D** **Learns By** •Taking Initiative •Exploring hidden possibilities •Relying on Intuition •Constructing Concepts •Sythesizing Content
Lower Left B **Learns By:** •Organizing & Structuring content •Evaluating & testing theories •Practice •Implementing content	**Lower Right C** **Learns By:** •Listening & Sharing ideas •Integrating experiences w/self •Moving & Feeling •Emotional Involvement •Harmonizing w/content

Our research has shown that different design and delivery approaches improve and facilitate learning in each of these four specialized quadrants. The following model show these four different design and delivery approaches.

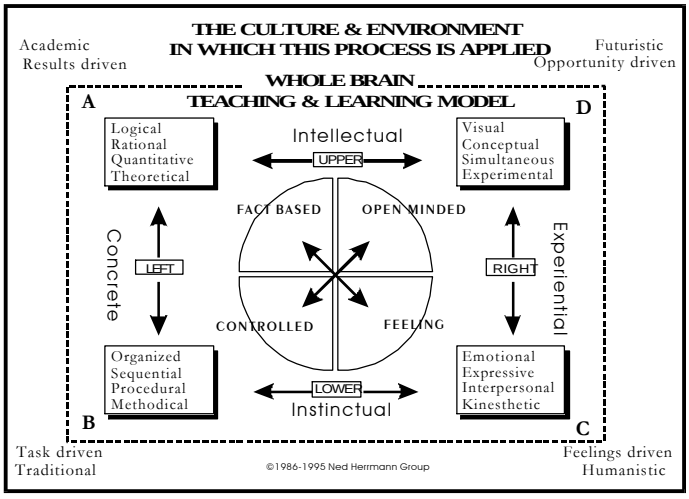
Design & Delivery Approaches for the
Specialized Modes of the 4 Quadrants

Upper Left A **Learners Respond to:** •Formal lecture •Data based content •Financial/Technical Case discussions •Text books & Bibliographies •Program Learning	**Upper Right D** **Learners Respond to:** •Spontaneity •Free flow •Experiential opportunities •Playfulness •Future oriented discussions •Visual displays •Aesthetics •Individuality
Lower Left B **Learners Respond to:** •Thorough planning •Structure •Sequential order •Lectures •Organizational & administrative case discussions	**Lower Right C** **Learners Respond to:** •Being involved •Sensory movement •Music •People oriented case discussions •Group interaction

Brain dominance data indicate that individuals in similar occupations tend to have the same general profile, therefore, accountants in one company compared to accountants in other companies have similar profiles and not only between companies, but also between different cultures around the world.

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 basis for the creation of a Whole Brain Teaching and Learning Model.

Whole Brain Teaching & Learning



Our preferences represent our "default mode" but we often "zig zag" around the model when we teach and learn. The arrows indicate the iterative nature of the process as it correlates with the physiology of the interconnected brain.

It is essential to consider the uniqueness of the learning group when designing educational programs for that group. With the use of the Whole Brain Model as a diagnostic tool, it is possible to better design the learning program to meet that unique requirement.

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 accomplished by creating a "tapestry" of approaches, moving back and forth with techniques and activities from each of the four quadrants, . Each key learning point, those that you "die" for, needs to be "paraphrased" in each mode at some point in the learning process. Using a Whole Brain approach in your design and delivery helps insure that participants with different preferences and interests are able to learn effectively and consistently.

Whether you are designing a learning point, module, workshop, or an entire course, look for ways to speak to the learners in all four quadrants. The following case study is a good practical example of how the whole brain teaching and learning model was successfully applied to an organizational learning challenge.

Case Study
Judy Strock, at Gateway Computers, faced a dilemma. She needed to achieve a consistent and effective presentation on organizational change at U S Gateway call centers, to be delivered by call center managers.

The Challenge
A significant performance management change needed to be introduced to employees who were not involved in planning the change. The change affected 2,5000 employees of Gateway US Call Centers. Call Centers are distributed geographically throughout the United States and are representative of the variety of regional differences that exist in the nation. In addition, Call Center employees are a composite of multicultural as well multi-developmental differences.

Purpose:
The overall objective was to effectively communicate this significant change in performance management so employees affected by the change (regardless of site or presenter) would receive the same information and the interpretation would be consistent.

It was also important o present the system in a way that employees could understand it, embrace it, and begin to use it.
The existing conditions:
The current performance management system was based on general job descriptions as well a reward system that paid employees for hours worked and employment status. The new performance management system is a proficiency based/performance level system designed to eventually pay employees for performance. Employees were not involved in the design of the system. Call Center managers knew about the new system and helped to design part of it.

Call Center managers were seen as a key to successful implementation and as such needed to drive the change. Having the managers present the system to their employees was seen as a critical piece in the implementation plan. They needed to take the responsibility for the system by "rolling it out" to their employees and be seen as the drivers of the system.

Call Center managers were not trained in presenting or in training design. They did not recognize that people differ in their need for information based on their mental preferences and so do not address these different needs in presenting information. They believed that no matter how they communicate a message their people will get it and be able to act on it. (It's the old formula: Information = Learning.)

In addition, some Call Center managers believed that all people need are the facts. Others believed that the components, process, and procedures are what people need to know. Most did not consider the human side of the information picture nor did they believe that some employees are interested in how the system fit into the larger Gateway picture. Because they had helped design the system they might not communicate all that needs to be communicated about the system because they knew too much about it and had forgotten what their initial concerns were.

Desired outcomes:.

Short term:

- To align the work force to implement the performance management process as it was intended to be implemented.
- To enable managers who are neither experienced presenters nor training professionals plan a training session that would communicate a consistent message that was efficient and answered employees "what's in it for me" concerns so by in by the people could be achieved and may not even be to put together a program that they would use to "roll out" the new program
  - ??To refine tweak the original training materials from the consultant so the training would address the information all employees needed to accept and understand the new performance management system.
  - ??To lower resistance to the new system by taking into account learner concerns based on their unique perspectives related to their metal preferences
  - ??To conduct a train the trainer session and provide the managers a structured, guided way to go about designing the presentation and give them a common language to talk to each other about what might be incorporated into the program
  - ??To minimize the amount of time needed to plan the presentation

Long-term:

Because Call Center managers now understand that their employees have a variety of needs for information based on mental perspectives, they will consider these needs when planning presentations and training. Since they have been trained in specific training strategies and processes to use to facilitate whole-brain learning, Call Center managers will use whole-brain strategies in future training.

Whole brain intervention methods, processes, and strategies:

A card sort based on the Herrmann Whole Brain Learning Model was used with 3 Directors and 9 Managers of Gateway US Call Centers during a 2 day training program to help them plan the 12 hour training program they would use to introduce a new performance management system to their employees. The Whole Brain card sort consists of 64 cards, 16 in each of the 4 brain quadrants identified in the Herrmann Model. Each card contains a training strategy or method. The training program in which the managers participated was whole-brained in its design and the trainer modeled the methods and strategies identified on individual cards. This provided learning experiences with which the managers could identify when they diagnosed the training program they planned.

Before the managers were introduced to the Whole Brain model they were asked to plan the 12 hour training program for "rolling out" the new performance management system and decide when and how to use the Power Point presentation left by the consultant. Once they had the program designed, they used card sort to diagnose the percentage of time that was being spent in meeting the learning needs of participants in the 4 different quadrants. Next, they identified the opportunities they had to improve their training design so the training would address the information and learning activities all employees needed to accept and understand the new performance management system. The identified activities in the different quadrants they want to include in the training design. Many times some individuals would say, "We can't do that in a business setting or in a business-oriented training session." Others would reply, "Wait a minute, what if we did it this way, … wouldn't that meet this learning need?" It was interesting to note how quickly the approach change from "We can't do that." to "How can we do that?"

After planning a training program that would honor the needs of all 4 types of learners, the

managers tweaked the Power Point presentation left by the consultant so that it was a whole-brained presentation.

Summary of Outcomes:

Short-term.

Call Center managers recognized that employees have different needs for information and learning approached based on their mental diversity. They designed a whole-brained training program they we all committed to using to "roll out" the new performance management system. After they presented the training, the feedback from employees on the new system was positive. The managers did not encounter the resistance and hostility to the new system that they anticipated and attributed this to the training program they presented.

Long-term.

The Whole Brain card sort is being pilot tested for further development and so the managers were not allowed to keep individual decks of the card sort. Several of the managers wanted to take a deck back with them for preparing future presentations. The cards certainly promoted the learning and the questioning the trainer wanted . The cards also pushed participants to incorporate materials and activities that the trainer had tried to get them to include in their training but were resisted until the cards were used. Once they decided for themselves that the materials and activities were important and figured out how they could incorporate them they were committed to them.

Conclusion

As you review your training programs and modules, look for ways to deliver your key learning points in all four quadrants. The results will provide a better experience for all involved: you as the teacher/trainer/presenter, the individual learners, and the sponsoring organization. You will never go back to teaching or training without your whole brain!