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Accelerated Learning and Short-Term Instructional Programs: Sustaining Interest and Intrapersonal Growth

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Introduction

The functions of short-term instructional programs for a diverse body of students are obvious in their intent to improve desired competencies within a relatively short period of time. However, the reasons why individuals participate vary, depending upon personal needs and motivations. Various needs may dictate different learning experiences. The more that these learning experiences may be viewed as the fulfillment of personal goals, the more motivated students become and the more likely they are to succeed. Conversely, the more that students fail to see the relevance of the experience, the less successful the experience and the program will be. Horvath's (1989) observations seem particularly important to the issues of learning and skill mastery of the instructional material encountered by learners.

Statement of the Problem

This monograph seeks to explore the relationship between accelerated learning and short-term instructional programs. Student learning in short-term programs can be improved if accelerated learning constructs are incorporated. In practice, this means that staff must (a) identify which hemisphere of the brain is dominant for each student, (b) determine which learning activities best exploit the learning potential of the left- or right-brain dominant students, and (c) identify the problems of sustaining interest in short-term programs. We will explore the major components of short-term programs and look at the function of accelerated learning within intensive retraining and educational programs.

Short-term programs may be defined as any systematic, instruc-

tional plan that ranges from one to eight weeks in duration. Generally, these programs must contain at least four basic elements to meet the needs of an accelerated learning model:

1. A carefully spelled out list of specific desired skill outcomes to be mastered;
2. A system for instruction, usually consisting of experienced *staff* personnel (who either have demonstrated competencies or else meet requisite minimum requirements such as advanced degree work, certification, or license) and a *curriculum* that clarifies what the desired skill outcomes are and how they are to be taught;
3. A planned, accelerated learning procedure that provides multisensory contact with those skills desired to be taught; and
4. A method of skill attainment evaluation. Short-term programs may range from staff development meetings to summer residential programs on college campuses.

Accelerated learning offers a unique opportunity for any institution, organization, business or industry to improve production, because it functions on a sound learning theory and appeals to individuals with divergent learning styles. This monograph proposes three points: first, that learning can be seen as a process governed by brain hemispheric traits; second, that most learners are either left- or right-brain dominant and said dominancy determines the patterns of learning that work most effectively; and third, that dual brain hemispheric learning can be incorporated into short-term programs to improve mastery of desired skill outcomes, based upon manipulation of stimuli that access the dominant brain hemisphere.

The central problems for any organization desiring to improve skill competencies rest in how best to ensure skill mastery. Because research into brain hemispheres has demonstrated the relationship between learning styles and hemispheric dominance, there is an obvious need to incorporate those findings into accelerated learning techniques that can improve learning competencies (Bullock & Salvatore, 1981; Cohen, 1988; Gold, 1984; Levine, 1989; Reid, 1985; Richards, 1984; Richardson, 1988; Seeman, 1988; Valett, 1981; Vitale, 1982).

Review of Related Literature

This monograph explores the function of accelerated learning, what it is, how it is implemented and executed, and what the implications of its incorporation are for students. A number of articles were examined to trace the development and impact of accelerated learning. Three distinct forms of analysis view accelerated learning (a) as a *resource or remedial teaching model* (Applegate & Hamm, 1985; Brewer, Dunn, & Olszewski, 1988; Caine & Caine, 1989; Elmore & Zenus, 1994; Horvath, 1989; Schreiber, 1988; Solorzano, 1987; Webb, 1983), (b) as an *integrated teaching strategy* (Caine & Caine, 1989; Campbell, 1980; Coble, 1983; Grabow, 1981; Joyce & Weil, 1980; Kussrow, 1993; Lipson, 1984; Partridge, 1983; Prichard,Schuster, & Gensch, 1980; Rose, 1985; Springer, 1987; Walker, 1985; Williams, 1983), or (c) as a *theory of learning dysfunction* (Bullock & Salvatore, 1981; Cohen, 1988; Gold, 1984; Levine, 1989; Reid, 1985; Richard, 1984; Richards, 1984; Seeman, 1988; Valett, 1981; Vitale, 1982).

Resource or Remedial Teaching Model

The first group of research, the resource or remedial teaching model, accepts accelerated learning primarily as a resource or remedial tool to help academically troubled students learn more efficiently. Accelerated learning is seen as a tool for the "tracked" student who needs additional instruction. The emphasis rests less with instructional models than with environment (Applegate & Hamm, 1985; Richardson, 1988). Applegate and Hamm identify the importance of relaxation, positive teacher reinforcement (especially for students with poor self-images), music, and stress reduction as keys to improved learning. Music, for example, tends to increase students' arousal levels, especially when accelerated to 65 beats per minute or more; conversely, ". . . slower-paced, convergent harmony selections of 55-65 beats per minute seem to lower arousal level of the students" (p. 75).

The traditional view of this model centers around the importance of providing a relaxed atmosphere. Those instructional techniques that access left-brain-centered skills are considered counterproductive to right-brain activities that focus more upon physical exercises and gamelike

activities (Bullock & Salvatore, 1981; Coble, 1983; Horvath, 1989; Reid, 1985; Schreiber, 1988). For example, lecture-based presentations are ineffective for students with short attention spans or those who prefer affective, interpersonal dialogue, interaction, and variety. A short-term program should try to integrate activities that require physical activities, sharing, and any non-cognitive based presentations. These kinds of instructional alternatives improve skill mastery because they are inclusive; they teach right-brain-centered students, too. Some even advocate the absence of structure within the school system (Horvath, 1989) or at least a significant reduction in traditional instruction—that is, left-brain-centered (Reid, 1985). It should be noted that this approach is viewed primarily as a behavior modification technique. Students learn based upon atmosphere, not necessarily brain-hemispheric considerations.

Integrated Teaching Strategy

The second group of research, the integrated teaching strategy, incorporates accelerated learning as an integrated teaching model. It is a system that can be built into any teaching strategy to help resolve minor, temporal learning problems. Accelerated learning is less an issue of brain dominancy (Springer, 1987), though enough research supports the division of skills (cognitive/left-brain versus affective and psychomotor/right-brain), than it is an instructional model—one that can focus time more effectively in certain instances. Some research perceives accelerated learning only as a quick-fix or a limited-application approach (Caine & Caine, 1989; Cohen, 1988; Levine, 1989; Schreiber, 1988; Solorzano, 1987; Williams, 1983). Springer (1987) notes in particular that ". . . those who seek to modify our educational systems and implement assessment and training programs, based on our knowledge of brain asymmetry, are indeed on shaky ground. Given the current state of knowledge, their ideas receive no support" (p. 25). This assessment tends to support the notion that the issue of brain-centered dominancy is less important in accelerated learning than the incorporation of multi-sensory activities.

The use of accelerated learning strategies within the classroom, then, may take many forms ranging from the inclusion of music, role-playing, discovery centers, guided- and visual-imagery, metaphors, and

physical activities ranging from calisthenics to sensory exploration (taste, touch, sight, sound, and smell). Elmore and Zenus (1994) observe substantial emotional and intellectual improvement among test subjects which substantiates the long-held belief that tracking is bad (Black, 1993), but mixing "equal and unequal" learners is positive for all sides (Carbo, 1992; Kulik, 1992; Murphy & Hallinger, 1993). Similarly, Kussrow (1993) reports improvements when accelerated learning is employed on a broad scale in the community. The traditional form of instruction, already seen as left-brain-centered, already involves sight and sound. The suggestion is to incorporate the other senses. For example, smell may trigger other associations (Williams, 1983) or sound may influence physical reactions (Applegate & Hamm, 1985). Diversity of approach dispels the monotony of repetition.

Learning Dysfunction

The final area of research, learning dysfunction, perceives accelerated learning as a viable technique to help learners resolve learning difficulties. Such learners are universally classified as right-brain dominant and the most meaningful learning will occur with those activities that engage the right brain. There is an assumption that because a learner is not verbally oriented, they must have a learning dysfunction. By using nonverbal techniques, such an analogies, illustrations, music, or affective sharing techniques, these learners will access the same skills and master them. In a short-term instructional program, this concept reinforces the value of alternative presentations of desired skill outcomes. Unfortunately, most academic instruction is left-brain oriented (Coble, 1983; Johnson & Johnson, 1993; Partridge, 1983; Richards, 1984; Springer, 1987; Walker, 1985; Williams, 1983). Research is beginning to establish the chemical relationship between the development of brain dominancy and how learning occurs. Nobel laureate Richard Sperry's research into brain functions has helped later researchers identify hemispheric learning centers. The left hemisphere governs cognitive, language-based thinking, including linear and sequential logic.

The right brain primarily governs affective and psychomotor skills (Coble, 1983; Partridge, 1983; Richards, 1984; Springer, 1987). Springer touches on brain dominancy in the issue of brain damage and split-brain

asymmetries in which damage to ". . . the left hemisphere could produce loss of speech, and damage to the right might result in spatial disorientation or inability to recognize melodies" (pp. 22-23). Richards explores the biological research of brain development and the presence of dendrite density as the brain ". . . spurts throughout childhood to way past puberty. New growth in the brain really refers to the density of the dendrite system, for it is the dendrites that help make the interconnections" (p. 2).

Research has demonstrated the relationship between right-brain dominancy and nonverbal learning. Students who are generally classified as slow learners and learning disabled (LD) share deficiencies in language-based learning. Typically, those students cannot function well in the traditional, left-brain centered classroom. However, more and more research is looking into methods for helping these students attain skill mastery through right-brain centered activities such as visual imagery, music, play, exercises, and synectics. Grabow (1981) notes that ". . . short attention span, distractibility, and lack of concentration have long been recognized as parts of the LD syndrome. Yet, it is also recognized that most people do not give 100% concentration all of the time, and that minds do naturally 'wander' in fantasy" (p. 615). Several studies contend that the use of guided- and visual-imagery, which involves right-brain centered skills, stimulates learning by translating lessons into play-like activities which achieve a higher level of comprehension (Applegate & Hamm, 1985; Bullock & Salvatore, 1981; McGarvey, 1990). Similarly, researchers have noted that those skills associated with the left-brain, namely cognitive reasoning and linear, sequential logic, are absent among LD students who cannot readily access these skills (Coble, 1983; Partridge, 1983; Springer, 1987; Richards, 1984; Walker, 1985; Williams, 1983). This research suggests that teaching strategies for learning disabled students should include accessing their right-brain dominant skills.

Statement of Hypothesis

Within a short-term program, student mastery of desired skill outcomes will be improved if the short-term program incorporates a dual brain accelerated learning model that accesses both hemispheres of the

brain. This process will motivate students to work harder by serving both left-and right-brain dominant individuals.

Data Analysis

Accelerated learning is a concept that involves integration of the strengths of both brain hemispheres in order to enhance the learning process. Each hemisphere of the brain governs certain affective, cognitive, and psychomotor skills. Students may be left- or right-brain dominant to greater or lesser degrees, and it is possible to determine hemispheric dominancy based upon certain learning traits (Lipson, 1984). Once identified and distinguished, it is possible to determine hemispheric dominancy and offer instructional methods that stimulate and use latent hemispheric skills.

The objective of accelerated learning is, then, to achieve whole brain learning with the implication that individual learning will increase because of improved access to multiple hemispheric traits. Accelerated learning is a concept whereby information is uniquely introduced; and it involves both the right and left hemispheres on both conscious and subconscious levels. Rose (1985) elaborates on the effectiveness of this concept. While most learning is subconscious, accelerated learning accesses and combines subconscious learning with the conscious level of instruction. The diversity of multisensory instruction and learning activities integrates all levels of awareness and improves learning.

The attraction and paradox is that the learner puts in no more conscious effort than normal because she or he is relaxed. It is the fact that material is presented in such a memorable way, to both the left- and right-brain hemispheres and the conscious and subconscious mind, that accounts for the dramatic improvement in the speed and activeness of learning. For example, in a short-term program, if guided visual-imagery or any visualization in teaching is utilized, learners will respond more enthusiastically because the concepts introduced are presented in unpressured poly-learning fashion. Cognitive-based programs are stressful for right-brain learners because they do not access those skills that most effectively help those learners attain skill mastery.

The brain operates in the two hemispheres, each with specific functions. Hooper (1992) associates left-brain dominance with manage-

ment abilities and right-brain dominance with leadership because in the former, we have logic and sequential thinking and in the latter, we have creativity and vision. As noted in Table 1, the left side appears to specialize in verbal, analytic, symbolic, abstract, temporal, rational, digital, logical and linear processes (Richards, 1984, p.14). The right side excels in nonverbal, synthetic, concrete, analogic, non-temporal, non-rational, intuitive, and holistic processes (Coble, 1983; Rose, 1985). The right brain also specializes in emotional, spatial, and appositional functions

Table 1
Hemispheric Specialization

Left-Brain	Right-Brain
Verbal—Using words to name, describe, and define	*Non-Verbal*—Awareness of things, but with minimal connections with words; recognizing music; and environmental sounds
	Visual-Spatial—Recognizing forms, designs, pictures, faces, and patterns
Sequential—Sequencing one thing after another	*Simultaneous*— Seeing things all at once
Temporal—Keeping track of time	*Spatial*—Seeing where things are in relation to other things, and how parts go together to form a whole
Logical—Drawing conclusions based on logic, one thing following another in logical order	*Gestalt*—Perceiving the overall patterns and structures, often leading to divergent conclusions
Analytic—Figuring things out step by step and part by part, taking things apart	*Synthetic*—Putting things together in form wholes
Rational—Drawing conclusions based on based on reason and fact	*Intuitive*—Making leaps of insight, often from incomplete patterns, hunches, feelings or visual images

(Richards, 1984), such as tactile and auditory perception, and kinesthetics. By distinguishing hemispheric dominance (modality) and latency, it is possible to create learning programs that capitalize upon dominant hemispheric tendencies while appealing, subconsciously, to other latent hemispheric tendencies. The result is accelerated learning. Programs can incorporate tools that use both hemispheres.

Very few people are totally left- or right-brain. This is evidenced by the majority of any given population that demonstrates competencies and weaknesses in both hemispheric-oriented outcomes simultaneously. Kitchens (1991) contends that in their study of a group of calculus teachers and their students, that students approached their studies relying either upon logic-based (left-brain) thinking or intuitive (right-brain). Unless math teachers begin to utilize teaching methods that capitalize on both hemispheric abilities, students will struggle (see Figure 1). Typically, there is a dominant hemisphere that may be referred to as the *modality* from which a person operates; however, some traits and abilities from the latent hemisphere will be present, too. The emphasis in most classrooms is upon cognitive or language-based instruction, latent traits associated with the left-hemisphere.

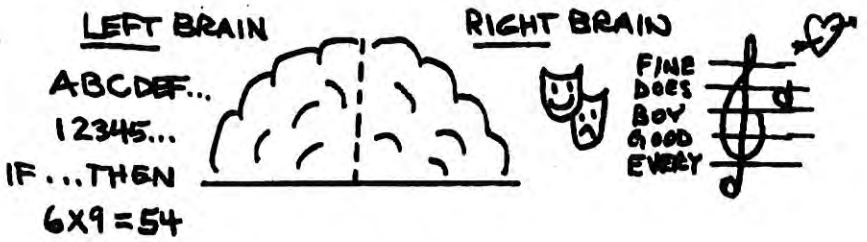

Figure 1. Left-brain and right-brain differences.

When dominancy occurs in one side or the other it is important to develop a means to access the latent half of the brain. Although a disparity exists between the dominant hemisphere and the latent hemisphere, most people are still able to use both hemispheres to some degree or another. How much an individual is capable of accessing the latent hemisphere of their brain determines the extent to which subconscious, imagery learning activities will prove effective. Visualizations may clarify points or ideas that verbal-oriented methods cannot overcome, if, for example, the affected person is right-brained dominant.

Brain dominance is determined using one of several techniques.

Coble (1983) explains the "Torque Test" in which the person ". . . draws a line of circles with each hand. If the subject draws all the circles counterclockwise, the left side of the brain is dominant. If the subject draws all the circles clockwise, the right side of the brain is dominant. However, if the subject draws some clockwise circles and some counterclockwise circles, then neither side of the brain is dominant" (p.12). This technique offers a simple, but effective method for determining left- or right-brain dominance and suggests whether or not nonverbal lessons are needed to improve desired learner outcomes. This test can be used to help identify students who have a left- or right-brain hemisphere dominancy, and applied to direct instructional methods. For example, a two-week training program dealing with staff development and utilization of equipment might be enhanced with illustrations, mnemonics, or analogies by addressing both hemispheres.

Richards (1984) provides the screening characteristics that may be used in an observational setting. These behaviors are characteristic of an individual whose right-brain is dominant. However, it is important to note that not all right-brain-dominant individuals will demonstrate all of those behaviors. It is possible, for example, that a right-brained individual may possess some left-brain characteristics, too, in that they may either lack dominance or else may be able to compensate for weaknesses that dominance may imply. In this case, inclusion of nonverbal instructional techniques will improve competency.

In Table 2, there is a clear disparity in cognitive skills and linear, sequential logic that is associated with right-brain dominancy. Such an individual does possess greater psychomotor and affective skills in displays of physical activity, personality, and nonverbal activities. In this list, Richards (1984) notes that not all right-hemisphere individuals display all these behaviors and that in some individuals, balance may be present.

In Table 3, the Determinants of Brain Dominance are reproduced from Lipson's 1984 article. This questionnaire provides background information on a given student's needs and characteristics that will enable the teacher to plan more effectively for individual differences (p.183). There are other methods to determine brain dominance. For example, dominance is indicated by the position of the hand when writing. Research has shown that a right-handed ". . . person who holds his hand in a hooked manner is right-brain dominant. The person who holds his hand

in the straight manner is left-brain dominant" (Coble, 1983, p.12). If a participant writes inverted then the hemisphere that is the same as the hand is dominant. Additionally, if a participant has performed particularly well in physical labor, music, and art, then that student has a right-brain tendency whereas the individual who has excelled in cognitive, language-based skills may be left-brain dominant. There is clearly a distinction suggested here between cognitive and psychomotor skill competencies based upon brain dominance that an instructor may want to consider.

Table 2
Right-Brain Modality and Dominance Screening

1. Appears to daydream.
2. Talks in phrases or leaves words out when talking.
3. Uses his fingers to count.
4. Draws pictures on the corners of his homework papers or dittos.
5. Has difficulty following directions.
6. Makes faces or uses other forms of nonverbal communication.
7. Displays fine motor problems (cutting, writing, or pasting) when asked to conform or do structured tasks. Fine motor problems rarely appear when the child is doing something he has selected.
8. Is able to recall places and events but has difficulty in recalling symbolic representations such as names, letters, and numbers.
9. May have difficulty in phonics or decoding skills.
10. Is on the move most of the time.
11. Likes to work partway out of his seat or standing up.
12. May exaggerate when retelling an event in which he has been involved.
13. Often has a messy desk.
14. Has difficulty in completing his work on time.
15. Likes to take things apart and put them back together again.
16. Displays impulsive behavior.
17. Tries to change the world to meet his own needs.
18. Likes to touch, trip, and poke when relating to other children.
19. Goes to the pencil sharpener often.
20. Gets lost coming to the classroom.
21. May forget what he went to his room to do.
22. May be very good in athletics but poor in subjects such as English.
23. Will give the right answer to a question but will be unable to tell you where it came from.
24. Will often give responses that are unrelated to what is being discussed.
25. May be a leader in the class.
26. May chew his tongue while working.

Overall, right-brain strategies will prove more successful with the participant who is active, creative, and rarely on time (Lipson, 1984). Lipson's questionnaire in Table 3 outlines other characteristics of dominance.

Questionnaires and profiles can prove invaluable not only in identifying students with right- or left-brain dominance, but also for suggesting a means of treatment. By providing learning opportunities that utilize latent hemispheric traits, it is possible to accelerate and improve the quality of individual learning (Bullock & Salvatore, 1981; Cohen, 1988; Gold, 1984; Levine, 1989; Reid, 1985; Richards, 1984; Richardson, 1988; Seeman, 1988; Valett, 1981; Vitale, 1982).

Table 3
Determinants of Brain Dominance:
An Educational Detective's Questionnaire

1. Writing position: ___straight (non-inverted) or ___inverted
2. Handedness (hand used for writing, cutting, throwing) ___right, ___left, or ___either
3. a. Subjects excelled in, according to past records (A's and B's):
   b. Subjects regularly given D's or F's:
4. What does student enjoy doing in school? Circle any that apply:
   Art Music Gym Drama Creative Writing Crafts
5. Does student have a vivid imagination?
6. Does he appear to learn more from humorous examples?
7. How is his sense of time?
   a. Always late-has difficulty remembering a time sequence ___.
   b. Always prompt-has a handle on sequence ___.
8. Has anyone described this student as hyperactive? Investigate.
9. Does he have a speech or language problem or has his record indicated speech therapy in the past? Investigate.
10. Does his medical history reveal persistent asthma or allergies?
11. Does his family tree support an unusual number of left-handed people with learning problems similar to this student?

In setting up a short-term accelerated learning program, the instructional component must consist of the following procedures:

1. Pre-testing of brain hemisphere dominancy—
   •This can be completed using any of the prescribed tests for brain dominancy before the program begins.

- •This can be completed based upon observable behavior that fits left- or right-brain characteristics.

2. Identifying instruction to be completed—
   - •What are the goals of the program?
   - •What are the objectives?
   - •How can instruction meet needs of left- and right-brain dominacy.
   - •Incorporate psychomotor and affective domain activities.
   - •Integrate mnemonics and game-like activities to enhance the program's appeal.
   - •Make sure the relationship between what is taught and what is learned is monitored.
3. Executing instructional design
4. Post-testing—measure skill outcomes—compare results between cognitive-oriented left-brain dominant and affective/psychomotor right-brain dominant students.

Accelerated learning occurs when students master desired skill outcomes despite brain hemisphere dominacy by using all possible feedback.

Need for Accelerated Learning

Most program leaders conduct instructional sessions in the way that they themselves learned. This approach, usually a traditional, dual-sensory delivery [that is, sight/observing and sound/listening, responding, etc.], tends to neglect students who do not learn well with those instructional techniques and style. Accelerated learning is a means of capitalizing on individual learning abilities by appealing to individual conscious and subconscious perceptions. According to Partridge (1983), if anyone demonstrates strong hemispheric dominance, then the teaching methods used with that person should strive to access that hemisphere. Gradually, the student can be directed to use the other hemisphere to reach optimum learning. Accelerated learning seeks to overcome teaching problems by appealing to both hemispheres.

The majority of short-term, program instruction takes place using verbal, analytical, rational, and logical thought, thereby, accessing the left brain almost to the exclusion of the right brain (Richardson, 1988). According to Lipson (1984) both hemispheres contribute to the learning process. Just because one side is more functional than the other does not

mean that the latter is entirely useless. Most people are neither totally left- nor totally right-brained. It varies from individual to individual, and establishing brain dominance is necessary to provide teachers with explanations of why students may perform the same task differently. However, the inclusion of nonverbal activities will increase overall skill mastery. Instructional techniques such as games, mnemonics, analogies, visualizations (graphs, flow charts, pictures), and music activate otherwise passive learning.

The central problem with cognitive-based-only instruction is that it is a passive form of learning. In a short-term program, lectures, questions and answers, and oral presentations only engage two senses—sight and sound. Affective teaching involves interaction, physical movement and alternative approaches to concept learning. A typical short-term program would mix both approaches, but focus on skill mastery and interaction.

Caine and Caine (1989) suggest that ". . . too linear and segmented [learning] actually deprives [students] of information and stimulation and therefore reduces the effectiveness of the process" (p. 68). This is often a problem with cognitive based programs. One possible solution is to establish an instructional model that considers more than cognitive learner outcomes. Accessing affective and psychomotor skills through imagery lessons (which provide visual pictures of the concepts to be taught) are more effective than too heavy a concentration on the cognitive domain. Unfortunately, our present educational system is primarily linear and segmented.

Richards (1984) states, "Our traditional educational system clearly places much greater value on left-hemisphere learning. Reading, writing, spelling, and math as they are presently taught in most classrooms are primarily left-brain activities. Students who process information in other ways are at a serious disadvantage and may not be learning efficiently" (p.2). It is interesting that a great deal of research has been done in the area of hemisphere dominance and learning disabled students (Applegate & Hamm, 1985; Cohen, 1988; Lipson, 1984; Partridge, 1983; Solorzano, 1987; Valett, 1981; Williams, 1983). By implication, the research suggests that there is a high prevalence of right-brain dominance in those students.

Divergent Thinking. As previously stated, the right brain is more

responsible for creative, integrated, divergent thinking. Teachers need to accept more divergent ideas and to play with words and ideas. Divergent thinking, accepting more than one right answer to a single question, allows students who are right-brain-dominant to explore options that may be atypical, but not necessarily wrong. To encourage divergent thinking, Valett (1981) suggests teaching and using *humor* in the classroom. It aids students' intellectual and cognitive development and provides a relaxed environment while promoting creative imagination. Obviously foreknowledge that certain students are right-brain-dominant can help both in the instructional design of the course and the selection of a relative teaching style necessary to motivate student learning successfully. Again, these methods access students who are not wholly cognitively-oriented. A language-only oriented program ignores students who learn better with non-cognitive techniques.

With regard to students, Webb (1983) concludes that ". . . those who have left-brain language competencies currently fare better in our schools; that the left-brain is the preferred brain in school learning" (p. 513). Webb's observation reflects the already noted bias toward cognitive domain skills associated with the left brain. Instruction is generally geared toward improving knowledge and instructional models are invariably verbally-oriented, whether dialogical or, in a self-paced or individualized learning model, monological. This is not to concede that right-brain-dominant students are totally disadvantaged. They possess certain affective and psychomotor skills governed by the right brain (latency) which are important to learning such as stamina, interpersonal skills, and self-efficacy.

Holistic Strategies. Webb (1983) notes later that ". . . learners who use both brains cooperatively fare best academically and socially; the greater the differential between the left- and right- brain functioning, the greater the emotional dissonance in the learner" (p. 514).

Foreknowledge of left-brain-dominancy similarly helps the development of appropriate stimuli for affective and psychomotor skills controlled by the right-brain latent hemisphere. The more expansive a student's skills are with respect to both hemispheres, the better they will perform in the classroom. Although left- and right-brain traits offer advantages concerning learning, combination of the two enhances learning mastery precisely because it offers more range of learning perception.

The easier students learn desired skill outcomes, the better their motivation will be. Accelerated learning programs resolve the problems of multivaried learning styles.

Providing a holistic environment for learning should be the objective for all learning institutions because it will help to insure maximum learner outcomes. A holistic environment may be best defined as sensory oriented. In addition to dialogic and monologic instruction, imagery presentation, sounds, smells, textures, and tastes will be incorporated into traditional pedagogy. Nonverbal-oriented students can master desired skill outcomes more easily from such a range of instructional presentations and left-brain-dominant students can benefit from dialogic and monologic senses. Any kind of learning latency may even be stimulated in this holistic environment that, in turn, results in modality. The more opportunities students have to learn whether they are left- or right-brain-dominant and to use their latent hemispheric traits, the better such students will perform in class. Consequently, it is necessary to discuss the supportive atmosphere required for accelerated learning to occur (Murphy & Hallinger, 1993). Techniques and suggestions to enhance right-brain participation concerning whole-brain learning will be emphasized more, because it is believed that there are enough techniques and curricula extant to access the left brain.

Supportive Environment for Accelerated Learning

A relaxed environment is key to accelerated learning because anxiety and stress tax the brain's resources, it hamper learning attentiveness, affect listening and motivation. A central problem with maintaining student motivation is the stress students feel about their own learning. Typically, students with low frustration levels become easily discouraged and are more likely to give up. Similarly, students who feel awkward about social or physical activities, whether within the classroom or not, suffer the same anxiety. They worry about what makes them feel inadequate and they cannot perform well. Applegate and Hamm (1985) report that aroused states signified by low physiological energy result in decreased learning. They suggest using *breaks* for short games, stretching, fast-paced music and motor skill games to help accelerate the state of arousal to high energy. Such interruptions stifle boredom, increase

motivation, and help right-brain latent students access those affective domain traits that they do not normally use in classroom activities. Although these activities are geared more to right-brain-dominant students, the change of pace would also appeal to right-brain latent students who may become re-motivated to learn. Re-motivation for non-cognitive oriented students involves precisely those skills that stimulate individual interest. Such activities represent the holistic learning environment. According to Hopfenberg (1993), learning should be intense and utilize a variety of creative activities, particularly those that involve problem-solving and inquiry.

Creativity and imagination begin with relaxation—in short, relief from anxiety and tension. Guided imagery works to reduce stress and tension by maximizing the power of the imagination. According to the study done by Prichard et al. (1980), ". . . it is becoming increasingly apparent that the use of suggestion to increase motivation and expectation together with the technique of relating visual imagery to lesson material constitute a powerful teaching methodology which is only beginning to be explored" (p. 60). Students can use the five senses to see, hear, smell, feel, taste, and experience anything in their imaginations. Sensory expression represents clearer mastery of desired skill outcomes. If an individual is able to experience a lesson through multi-level sensory perceptions, their comprehension will be more advanced based upon a variety of expressions instead of a dialogical one, and their ability to perform the desired skill outcome becomes similarly multi-dimensional. Although most learning occurs using hearing and sight, providing a texture to the concept helps students to recreate, mentally, the concept and give it a voice to it.

Traditional sensory pedagogy utilizes dual- or mono-dimensional sensory perceptions: sight and sound. Comprehension is possible; however, it is language-oriented and tends to discriminate against right-brain- dominant students who benefit more from psychomotor kinetics. Traditional sensory pedagogy does not take into account the multi-textual nature of desired skill outcomes. The full kinetic effect of all the senses is realized, which helps students to master these outcomes from different sensory perceptions. The more students understand, the better able they are to express ideas fully. Holistic kinetics, fostered in an holistic learning environment, provide such opportuni-

ties because there are more ways to experience the lesson.

Students must be comfortable in order to experience optimal learning. The following are guidelines for guided visual imagery as suggested by Bullock (1981):

- •Sit comfortably (feet flat, Indian style, or lying down)
- •No movement, eyes closed
- •Focus on one sound, often something in nature
- •Use all 5 senses
- •Deep breathing/tension-relaxation of each muscle from toes to head
- •A narrator can lead students to dismiss negative thoughts and feelings and replace them with positive self-talk by having students imagine themselves in a soothing environment and experiencing success.

This approach illustrates the holistic, kinetic principle that the participant engages first in relaxation techniques, important to learning (Applegate & Hamm, 1985; Coble, 1983; Horvath, 1989; Williams, 1983) and then in activities that are conducive to their learning style (left- or right-brain-dominant). Bullock and Salvatore (1981) relaxation guidelines engage every student's internal experiences that can be related to whatever desired skill outcomes are being taught. It is certainly well-documented that many students fantasize during class (Cohen, 1988; Grabow, 1981; Lipson, 1984; Vitale, 1982; Williams, 1983). Activities such as these will direct student fantasies in order to improve skill mastery because they re-orient thinking; purge anxious, tense thoughts; and focus sensory attention.

Guided Imagery and Fantasy

Bullock and Salvatore (1981) indicates that students achieve more success at problem-solving if they are able to fantasize and use guided imagery as part of their learning experience. Holistic sensory kinetics provide a means by which students can more fully understand a desired skill outcome. Fantasy is best viewed as the most free-form imagination. Guided imagery helps students to visualize and experience desired skill

outcomes by teaching them to expel stress. It is interesting to note that Bullock's suggestions involve not only relaxation, but a stifling of sight and sound senses, the two senses associated with traditional, language-oriented pedagogy. Guided imagery also helps left-dominant students learn how to use their right hemisphere traits. Although sight/sound sensory experiences benefit left-brain dominant students, attempts to use right-brain latent traits are equally important. They provide what Webb (1983) describes as experiences in which ". . . both brains cooperatively fare best academically and socially" (p. 514). Bullock and Salvatore conducted a study in which students were surveyed on their ability to perceive fantasies or imagined experiences using the five senses. Results demonstrate that visual imagery experiences and relaxation exercises are most successful in helping students.

Grabow (1981) states that guided fantasy can be beneficial in enhancing success, setting the tone, and relaxing students before exercises requiring great concentration. Once a state of relaxation is achieved, one of many methods may be implemented to access the right brain and facilitate whole-brain learning or accelerated learning.

Techniques for Accelerated Learning

In the accelerated learning (AL) arsenal, there are different methods for developing effective learning domains for short-term programs (Bullock, 1981; Caine & Caine, 1989; Campbell, 1980; Coble, 1983; Cohen, 1988; Gold, 1984; Grabow, 1981; Joyce & Weil, 1980; Levine, 1989; Lipson, 1984; Partridge, 1983; Prichard, et al., 1980; Reid, 1985; Richards, 1984; Richardson, 1988; Rose, 1985; Seeman, 1988; Springer, 1987; Valett, 1981; Vitale, 1982; Walker, 1985; Williams, 1983). Based upon research, the following breakdown provides a guideline for accessing the two brain hemispheres: left-brain (cognitively-oriented) and right-brain (conceptually-oriented).

Accessing Conceptually-Oriented Dominancy

Four particular techniques can particularly useful in accessing conceptually-oriented dominancy—music, mapping, acrostics, and synectics.

Music. *Music* can have a very powerful impact on students and its use has just recently become popular in the classroom. As noted previously, researchers have found that music with 65 beats per minute or less is very relaxing whereas music with 65 beats per minute or more can be very arousing. Reid (1985) states, "Singing is a powerful method of accelerating learning because tunes and lyrics are stored and processed in areas of the brain associated with the imagination, emotions and senses. Learning and recall through song involve powerful mental circuitry that seldom is stimulated when using traditional classroom teaching techniques" (p.25). A teacher can therefore create the desired environment through the use of music. However, using Bullock and Salvatore's (1981) model, anxious students must be acclimated to musical integration in the classroom. Music represents more than sound perceptions because it includes language in the form of words and in human sound effects, but also nonverbal instrumentation as well. The melody and choice of instrumentation communicate nonverbal signals which students understand just as completely as verbal messages. Sounds can create mood, evoke certain emotions, or even sublimate verbal messages. Learning and recall are connected to the rhythmic cadences and natural sound patterns all students possess. Students hear and remember language and ideas around one mnemonic system called a song. Ironically, the verbal language becomes part of the instrumentation that makes recall easier. By incorporating music in an accelerated learning program, students can become relaxed and improve in comprehension.

Mapping. *Mapping* is another technique that may be used in accelerated learning. Gold (1984) discusses cognitive mapping or "graphic representation of text" (p. 277). A map is a pictorial image in the mind that creates memory. The information present in a map should be present in a hierarchical order of importance. The center of the map should be a restatement of the objective(s) of the lesson or the main concept to be gained. Facts are filled in on the branches and logical conclusions are drawn from the facts. This visual representation aids in comprehension and retention. In Gold's study of 1982, they showed that students who participate in a cognitive mapping program have higher level functions in language comprehension and listening skills.

Acrostics. Reid (1985) discusses the memorization aid known as *acrostics*. Acrostics use the first letter of each word in a list to aid

memorization. Put together, the letters may form a word or sentence that is easier to remember. One example is the familair "*E*very *G*ood *B*oy *D*oes *F*ine" acrostic to help music students learn the *E-G-B-D-F* notes on the *lines* from bottom-to-top on the treble cleff staff (see Figure 1). Another acrostic, *F-A-C-E*, helps them learn the notes on the spaces. This approach seeks to simplify a complex function through association. An acronym triggers memories that help students reconstruct the desired information.

Synectics. *Synectics,* another method used in accelerated learning, is the making of analogies. As Cohen (1988) puts it, it is ". . .making the strange familiar and the familiar strange." Teaching by analogy is the most natural method of experimental learning. It contextualizes the unknown by associating it with what we already know or can know. One desired skill outcome represents a synchronous relationship with another. By using what we know to look at the unknown, we increase understanding and knowledge. In this sense, synectic learning is like a pair of glasses that metaphorically helps us to see something that is otherwise unfocused. Joyce and Weil's (1980) *Models of Teaching* provides a six-step process for synectic writing.

In each of these non-cognitively oriented methods, the focus is behavioral and interactive. All senses are used, not just the two (sight and sound) associated with cognitive-based learning. Accelerated learning models make skill acquisition natural and translate more complex concepts into manageable sensory lessons and experiences.

Accessing Whole-Brain Dominancy

The optimum condition is for learners to team both brains in each stimulating experience. Therefore, left-brain learners should be encouraged to use skills that will strengthen their right brains, such as drawing, doodling, and following maps and directions (Webb, 1983). Likewise, right-brain learners should be provided opportunities to expand their language base and develop effective problem-solving skills. As previously noted, most learners possess traits from both hemispheres. However, when dominance occurs, instructional opportunities should be inclusive enough to initiate traits from the latent hemisphere. Those students who possess and learn best through language-based, verbal instruction need to be ex-

posed to various affective and psychomotor activities. The more left-brain-dominant students use their right-brain latent hemisphere, the more expansive their learning will be, and vice-versa. All learners possess some traits of the latent hemisphere. By incorporating activities which excite that latent hemisphere, students will train themselves to rely upon those skills which enhance comprehension.

Clustering. Coble (1983) describes a method that accesses both sides of the brain in organizing and accessing information called *clustering*. He states that ". . . to teach students how to cluster information" a teacher should first draw a circle in the center of the chalkboard. In that circle, the teacher should print in capital letters the main idea of a book or short story that the students are currently reading. The teacher should put the other ideas that relate to the main idea on lines branching out from the circle, as seen in Figure 2. The cluster, or pattern, that emerges from the use of the circle and lines produces a comprehensive feedback for the person processing the information" (pp. 5-6).

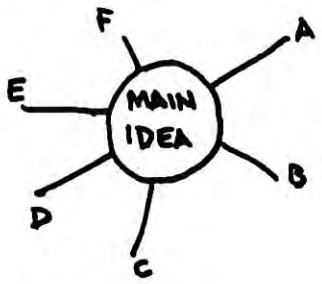

Figure 2 . Coble's clustering of ideas radiating from main idea.

The book or story Coble describes, of course, is the language-based, verbal access to the left-brain hemisphere that governs cognitive skills. Right-brain-dominant students will likely experience problems with this text; however, the introduction of visualizations—circles and lines—provides an alternative access for those students who may, in time, be able to bridge their left-brain skills with the dominant right-brain traits. In the examples of the circle and extended lines, the comprehensive feedback system creates an alternate sensory activity that broadens learning opportunities.

Reid (1985) agrees, and points out that ". . .involving the whole

(physical, mental, conscious, unconscious, logical, emotional, verbal, pictorial) student contributes to his or her ability to learn faster and more completely. Sounds, sights, tastes, smells, feelings—anything that stimulates the emotions of the student—help learning to occur faster with less effort" (p. 27). Cooperation between the left and right hemispheres is necessary. We must have whole-brain learning. Table 4 gives instructional strategies that promote whole-brain learning. Richards (1984) breaks this list down into three categories: (a) verbal/nonverbal learning, (b) sequential/simultaneous learning, and (c) logical/intuitive learning.

Support for Accelerated Learning

Problem-solving skills and critical-thinking skills are an integral part of accelerated learning. Schreiber (1988) suggests critical thinking can be taught using the three methods of communication, creativity, and problem-solving. Communication is incorporated in every lesson that involves small groups and partners. This also puts the teaching into the hands of the students. Creativity can be encouraged using techniques that provide fluency, flexibility, originality, and elaboration such as brainstorming and visual imagery. The problem-solving category can be encouraged using manipulation and prioritizing techniques.

Experiential Teaching

Experiential teaching provides experiences that students can associate with, to help them remember new concepts and ideas easier. Students need to *experience* the world in which they live. If teachers are successful in providing them, then learners will have enjoyable experiences, with learning as a by-product (Hopfenberg, 1993). Seeman (1988) argues that some knowledge is not conceptual. It may be illogical and nonverbal—involving body language. Thus, effective instructors should incorporate subject matter that includes emotional content. For example, in a short-term program, interpersonal feedback and competitive game-like models can be used physically to prove a point. Seeman suggests that students' feelings are often more important than their expanse of knowledge. Students must learn to see experiences from other peoples' perspectives and from differing points of view. Role-playing,

Table 4
Instructional Strategies that Integrate Modes from Both Brain Hemispheres

Verbal - Non-Verbal Learning

1. Visualization-Imagery: for academic and affective learning;
2. Picture writing and picture notetaking: for reading comprehension, sequencing;
3. Music: for transition, stress reduction, instruction;
4. Rhythm: for spelling, math, to assist with rote memorization;
5. Gestures: signing and finger spelling for spelling, language development;
6. Movement: using whole body and kinesthetic mode;
7. Demonstration: modeling and giving examples of desired result; and
8. Color: to emphasize, exaggerate critical elements.

Sequential - Simultaneous Learning

1. Mind-Maps and Clustering: for organization, writing, teacher concepts;
2. Scanning: reviewing material to get "big picture", to increase reading speed;
3. Estimating: making sensible guesses in math;
4. Testing Variety: using untimed tests as well as timed, essay questions as well as true-false, multiple choice questions;
5. Unlined Paper as Well as Lined: providing alternatives for students, including colored as well as white;
6. Chairs and Desks in a Variety of Patterns: not always in rows;
7. Overview of Lesson: Where are we going?
8. Culmination Activities: Where have we been?
9. Simulations: putting learning in context; and
10. Study Techniques—SQ3R: survey, question, read, recite and review.

Logical - Intuitive Learning

1. Relaxed, Positive Atmosphere: creating a classroom atmosphere conducive to learning;
2. Atmosphere of Trust: establishing relationships, classroom practices free from threat;
3. Brainstorming: nonjudgmental stimulation of ideas, solutions;
4. Metaphors: making associations and links;
5. Fantasy: creating mental pictures, using imagination;
6. Dance: using body and movement to integrate learning;
7. Values Clarification: activities to develop self-concept;
8. Self-Esteem activities: opportunities for success and acceptance of individuality;
9. Class Meetings: practices to encourage group problem solving;
10. Think-Aloud Problem Solving: using self-talk for self-control; and
11. Humor: riddles, jokes, puns for divergent thinking, motivation.

sociodramas,
psychodramas, or simulations are forms of experiential learning.

All students need varied activities throughout their day, especially opportunities for physical movement. It is possible that they can benefit from different kinds of background music to aid their associations. Additionally, teachers should let them go to the chalkboard or pass out papers, and use kinesthetic or body movements such as jumping jacks (as illustrated in Figure 3) or clapping when memorizing facts like multiplication tables.

Figure 3. Physical activities such as jumping jacks may have a place in your accelerated learning program.

Providing ample opportunity for creative writing and oral storytelling is suggested as well. Teachers should provide humor in their instruction. Humor has a way of decreasing tension and anxiety and allowing expression of creative imagination. Also, a positive attitude is a very important aspect of accelerated learning; therefore, it is essential that the instructor display enthusiasm and high energy toward the subject matter.

Self-concept

Self-concept is another very important key in the accelerated learning process. One objective of the accelerated learning program is rebuilding the self-image and self-esteem ". . . using effectively oriented techniques that will make them [students] feel good, important and capable of learning" (Richardson, 1988, p. 5). It is imperative that students' self-concepts are enhanced by instructors at every available

opportunity. In a short-term program, accelerated learning accomplishes this goal because it varies learning styles, targets students' right-brain-dominancy and offers viable instruction. Learners feel positively about themselves when they know that they are mastering a task. There is such a thing as a "life fulfilling prophecy." If a child is told that he or she is stupid from age two to their teens, then more than likely that child will not aim any higher and the prophecy will be fulfilled. Conversely, the "Pygmalion Effect" is possible if teachers always express high expectations of students who then seek to confirm their teacher's estimation.

Conclusions

According to many researchers, integrating the kinds of brain hemispheric activities associated with accelerated learning research is still foreign to most educational systems (Coble, 1983; Partridge, 1983; Richards, 1984; Springer, 1987; Walker, 1985; Williams, 1983). By ignoring a holistic approach to learning, teachers prevent whole-brain learning from occurring, and circumvent students from reaching their full academic potential. The merits of accelerated learning are tremendous and the varied techniques, if applied appropriately, will produce students whose only limits are their own imaginations (Horvath, 1989).

The research examined in this monograph supports the application of accelerated learning as a means of enhancing individual learning potential. For the right-brain-dominant individual, this approach translates desired learner outcomes into a reality because the language-based, cognitive domain is not the sole medium of learning. Instead, students can be introduced to a new concept or skill through other means. For the left-brain-dominant learner, opportunities for learning, while not as dramatic, are nonetheless expanded.

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