TEACHING TO THE RIGHT SIDE OF THE BRAIN TO ACHIEVE WHOLE-BRAIN LEARNING:

ITS EFFECT ON LANGUAGE LEARNING WITH LOW-LEVEL, LOW-LITERATE ADULT ESL STUDENTS

By

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CHAPTER ONE: INTRODUCTION

Teaching English as a second language to low-level, low-literate adult immigrants is my passion and my greatest challenge. I love it, yet I am frustrated by the difficulty of reaching and engaging these learners through traditional texts and teaching methods. Because I feel a need to find less traditional, more effective teaching methods, the focus of this study is to explore additional teaching options for the purpose of enriching and improving the learning experience of this specific group of learners.

Researcher and Participants

I am a second-year teacher of English as a second language (ESL) to adult learners at an urban adult learning center in Minnesota. The learners in my classroom are primarily Karen refugees from Burma (Myanmar), with little or no formal education in their first language (L1). For some of them, the ESL classroom is their first experience with formal learning, the Roman alphabet, and sometimes, with writing. Other learners have experienced inconsistent formal educational opportunities due to political instability and oppression in their native country, and trauma in their personal lives. Minimal L1 literacy poses a very real obstacle to learning a second language for all of them.

In my classroom, by trial and error, I have supplemented a required textbook with communicative role-playing activities, total physical response (TPR), manipulative-tactile activities (spelling vocabulary words with tiles), drawing, visualizing, and the use of real objects and colorful two-dimensional pictures to promote language learning. It is

my bias and belief that these alternative approaches to teaching and learning have successfully engaged the learners. I also believe that teaching the same material in a variety of ways benefits second language (L2) comprehension. The question is why? What exactly am I doing to foster better learning? What learning processes lie behind these alternative activities? Is there more that I can do to promote such learning processes?

The above questions have led me to explore different theories of learning. One theory that most interests me is the brain-based *right-brain approach* to learning. Right-brain learning can be defined as contextual learning as opposed to textual; studying the whole (the forest) as opposed to the parts (the trees). In the classroom, the right-brain approach to learning includes collaborative group work and hands-on activities such as role-plays, experiments, field trips, and simulations as opposed to lectures. Also included are the use of real three-dimensional objects (realia in ESL), two-dimensional colored pictures, and the use of manipulatives in math and in spelling (Connell, 2005; Danesi, 2003; Reis, Gueireiro, & Castro-Caldas, 1994; Williams, 1983; Wolf, 2010). While it is not new, but somewhat controversial, I believe this learning approach may benefit the learners in my classroom. Through a purposeful study and application of the right-brain approach to learning, I hope to observe improved learner engagement and comprehension. My goal as a teacher, is to deliver a more complete, balanced, *whole-brain* educational experience to low-level, low-literate adult ESL learners.

Supplementing Textbooks

In my classroom, I use the *Ventures Basic* ESL textbook (Cambridge University Press) for adult learners. This textbook includes topical action-filled scenes in full color to introduce each unit, full color picture-word matches, listening/reading activities, writing activities, graphic organizers, some mingles, and role-plays. To be sure, this textbook offers a variety of learner-centered activities, but, still, something is missing. Research has suggested that print-heavy textbooks and traditional teaching techniques primarily teach to the left cerebral hemisphere of the brain. This is the verbal, analytical processor that works in a specific, logical, sequential manner (Farmer, 2004; Sousa, 2006). It's possible that the non-verbal, emotional, holistic (big picture) processing mode of the right cerebral hemisphere is not addressed in that learning experience (Connell, 2005; Farmer, 2004; Gulpinar, 2005; Luvaas-Briggs, 1984; Reis, 2006; Williams, 1983). As a result, I have found that, for low-level, low-literate adult ESL learners, alternative activities are needed to supplement the textbook to insure engagement and comprehension. Learning activities that engage both hemispheres of the brain may achieve a more successful whole-brain learning outcome. Figure 1.1, below, describes right-brain and left-brain functions.

In my classroom, I have found that low-level, low-literate adult ESL learners need to be given the opportunity to learn in many different ways. They need repetition as well as variety in learning activities for successful L2 comprehension. While the whole brain is involved in all learning activities most of the time (Danesi, 2003; Farmer, 2004; Ornstein, 1997; Sousa, 2006; Wolfe, 2010), research has suggested that bringing right-

brain associated learning activities into the classroom enables teachers to offer learners more than one cognitive approach to learning new material (Connell, 2005; Connell, 2009; Farmer, 2004; Luvass-Briggs, 1984; McCarthy, 1987). In my particular teaching situation, introducing right-brain associated activities to promote engagement and

Left- Brain Functions

- Constantly monitors our sequential ongoing behavior
- Responsible for awareness of time, sequence, details, and order
- Responsible for auditory receptive and verbal expressive strengths
- Specializes in words, logic, analytical thinking, reading, and writing
- Responsible for boundaries and knowing right from wrong
- Knows and respects rules and deadlines

Right- Brain Functions

- Alerts us to novelty; tells us when someone is lying or making a joke
- Specializes in understanding the whole picture
- Specializes in music, art, visual-spatial and/or visual-motor activities
- Helps us form mental images when we read and/or converse
- Responsible for intuitive and emotional responses
- Helps us to form and maintain relationships

Figure 1.1. Left-Brain and Right-Brain Functions. Adapted from *"Brain-Based Strategies to Reach Every Learner: Surveys, Questionnaires, and Checklists That Help You Identify Students' Strengths – Plus Engaging Brain-Based Lessons and Activities,*" by J.D. Connell, p. 40. Copyright 2005 by J.D. Connell.

comprehension may positively support and supplement a textbook used by learners who have minimal classroom and/or orthographic experience.

Guiding Questions

In order to achieve a more balanced teaching curriculum in my classroom, this study has been designed to explore the integration of right-brain associated learning activities with a left-brain associated textbook teaching approach. With this in mind, the questions guiding this research are: (1) Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language learners? (2) With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve learning? (3) Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach?

Chapter Overviews

In Chapter One I introduced the purpose, significance and need for this study. The context of the study was briefly introduced as was the role, assumptions and biases of the researcher. The background of the researcher was provided**.** In Chapter Two, I provide a review of the literature relevant to the topics of neuroscience research as it applies to hemisphericity. I further explore literature relevant to the educational applications of neuroscience research and hemisphericity in the areas of brain-based learning (BBL), left-brain/right-brain dominance, and the right-brain approach to learning as it seeks to achieve a whole-brain, balanced learning experience. I relate this research to my specific classroom teaching situation. Chapter Three includes a description of the research design and methodology that guides this study. Chapter Four presents the results of this study. In Chapter Five, I reflect on the data collected as well as discuss the

positive and/or negative results of including right-brain associated learning activities into my classroom curriculum. Additionally, I discuss how I might alter my class preparation and teaching in order to include right-brain associated instruction. I then present my personal collected anecdotal impressions as well as an analysis of learner self-reported data of engagement and comprehension. Finally, I discuss limitations of the study and implications and/or recommendations for further research.

CHAPTER TWO: LITERATURE REVIEW

The purpose of this study was to determine whether integrating right-brain associated learning activities with a left-brain associated textbook approach would positively affect language learning for low-level, low-literate adult English language learners. Questions I posed were these: (1) Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language learners? (2) With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve learning? (3) Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach?

This chapter will first present a discussion of the unique qualities and needs of a specific group of low-level, low-literate adult ESL learners. Next, a review of literature concerning neuroscience research as it relates to brain hemisphericity and its historic relationship to education will be discussed. Additionally, this chapter will introduce the cognitive learning theory of brain-based learning (BBL) and how educators have applied it to classroom curricula. Finally, a facet of brain-based learning, right-brain/left-brain/whole-brain learning, will be discussed as it relates to the researcher's specific ESL teaching situation.

The Unique Needs of Low-Level, Low-Literate Adult ESL Learners

The current study focuses on a unique group of adult learners, Karen refugees from Burma, who have no or very little experience with print or formal education. The Karen people are typically from small farming communities, and their education in Burma, for the most part, is based on cultural tradition (Barron, Okell, Yin,Van Bik, Swain, Larkin, Allott, & Ewers, 2007; Infomekong.com, 2010). Karen children are taught at home by their parents and elders. There, they learn practical, informal skills relevant to their lives so that they can become competent adults within their communities. Girls learn household chores and boys are taught how to farm (Infomekong, 2010; Karen Teacher Working Group, 2005; Nakashima & Vaddhahaphuti, 2006; The Peoples of the World Foundation, 2011). This practical, informal, and cooperative teaching approach contrasts sharply with traditional Western teaching where learning largely takes place in a classroom through print such as textbooks, worksheets, workbooks, white boards, overhead projectors and written tasks (Farmer, 2004; Gardner, 2004; Sousa, 2006; Vinogradov, 2008). Lee and Hung (2009), in their study of the effect of using whole brain instruction on accounting learning, suggested that traditional western school systems teach learners to be linear thinkers and to take in new knowledge passively without linking concepts to their real lives. Furthermore, Sousa (2006) concurs by stating that most educators readily admit that schools are predominantly left-hemisphere oriented: (1) schools are structured environments that run on time schedules; (2) they favor facts over patterns; and (3) they primarily offer verbal instruction, especially at the secondary level. Farmer (2004) reinforces the belief that education in the United States

has tended to favor the left-brained learner, working independently in a logical, sequential manner and that the creative nature of the right-brain needs to be valued (2004). It is this researcher's experience that a predominantly left-brain focused teaching method proves to be challenging, at best, for non- or semi-literate Karen refugees.

Karen refugees often spend many years in Thai refugee camps before coming to the United States. Many of the camps offer primary education but few offer secondary or post-secondary education (Karen Teacher Working Group, 2011). The majority of Karen learners in this study have entered the ESL classroom with zero to six years of formal education in their native language. Given their brief experience with formal education in Thailand, as well as the sharply contrasting systems of education between the United States and Burma, reaching these learners in a meaningful way is difficult. Print-heavy lessons do not seem to be the answer.

To find the answer, an important starting point for this paper will be to review past and current neuroscience research as it pertains to education and to second language learning. What connection does brain hemisphericity have with learning and learning styles? Furthermore, if such a connection exists, what effect could it have on the learning experience of the ESL learners in this study?

Neuroscience Research and Its Connection with Brain Hemisphericity

Pertinent to the purpose of this study, the effects of adding right-brain associated instruction to classroom curricula, is the history of scientific research as it relates to brain hemisphericity. It was Dr. Roger Sperry's experiments with hemisphericity that, to this day, have profoundly influenced the study of cognitive processing (Danesi, 2003;

Ornstein, 1997; Sousa, 2006; Springer & Deutsch, 1998; Williams, 1983). Through his famous work with "split brain" patients in the 1960s, he discovered that the two brain hemispheres could be separated by severing the corpus callosum, the thick bundle of nerve fibers that connects the two hemispheres and allows them to be in constant communication with each other. By surgically severing the corpus callosum in patients severely afflicted with epilepsy, Sperry prevented epileptic seizures from spreading from one hemisphere to the other. An occurring seizure would be isolated in one hemisphere while the other hemisphere would continue to function normally. An additional outcome of this surgery was that with the communication channels severed between the two hemispheres of his patients' brains, Sperry could study the independent functions of each (Ornstein, 1997; Sousa, 2006; Springer & Deutsch, 1998; Williams, 1983; Wolfe, 2010). Now, it was possible to explain the capabilities and limitations of each hemisphere. Through a series of carefully designed studies of these "split brain" patients, Sperry was able to show that the right hemisphere could perform spatial tasks such as drawing and face recognition but had no language capabilities. In contrast, the left hemisphere controlled speech, calculation, and reason but could not perform spatial tasks (Ornstein, 1997; Sousa, 2006; Williams, 1986). Largely as a result of Sperry's studies, it was recognized that both hemispheres are involved in higher cognitive functioning, with each half of the brain complementing the other for different kinds of processing, all highly complex (Ornstein, 1997; Sousa, 2006).

Significance to Education

Since Sperry's research in the 1960s, interest in neuroscience research concerning brain hemisphericity and its possible connection with hemispheric dominance and individual learning styles has grown tremendously. Differing opinions abound in both the scientific and educational communities. Some contend that people are either right-brain or left-brain dominant and that this dominance affects personality and learning style (Farmer, 2004). Additionally, left-brain dominant people tend to be piecemeal, logical, and sequential in their approach to learning while right-brain dominant people favor a more random, holistic, and intuitive learning approach and tend to relate more the to the visual world (Farmer, 2004). Other educators and researchers suggest that rather than being right-brain or left-brain dominant, people are right-brain or left- brain "preferred" (Sousa, 2006). Yet another group contends that left-brain or right-brain dominance is a "neuromyth" and that logic is neither confined to the left hemisphere nor is creativity confined to the right (Wolfe, 2010). Furthermore, this group argues that in a normal brain, the two hemispheres do not function independently so that is is impossible to educate only one hemisphere. Specialization does not mean exclusivity, and there is no evidence that people are either left-brained or right-brained. They do support the premise that one hemisphere may be more active in most people, but only in varying degrees (Alferink, 2010; Caine & Caine, 1991; Sousa, 2006; Springer & Deutsch, 1998; Wolfe, 2010). Researchers and educators seem to agree that people do exhibit differing preferred learning styles. What they do not agree on are the possible influences of hemisphericity on those learning styles.

Brain-Based Learning

As a result of Sperry's research and more recent research using imaging techniques such as Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) with "whole-brain" individuals, educators in the late 1980s and early 1990s continued their interest in learning about brain-based research and in finding ways to reach their ever increasing numbers of diverse learners (Connell, 2005; Farmer, 2004). Today, American classrooms include gifted students as well as ever increasing numbers of English language learners, refugees, and students with special needs (Connell, 2005). The current study includes adult refugees and immigrants at differentiated levels of English language learning as well as learners who suffer from the effects of extreme mental and/or physical trauma from their past. As a result of the diversity in K-12 as well as adult learner classrooms such as the one in this study, a relatively new field of brain-based learning (BBL) has emerged.

Defining Brain-Based Learning

In their seminal book *Making Connections: Teaching and the Human Brain* (1991), Caine and Caine suggested the use of brain-based teaching techniques to improve American educational practices and subsequent learning outcomes. In their book, the Caines laid out twelve brain/mind learning principles, later to be known as BBL.

The Caines' twelve principles are based on their theory that natural learning is biological as well as psychological, and that every characteristic of a human being, including body, emotions, mind, social relationships and physical context, is involved in learning. The principles were developed by synthesizing and integrating research from

many different disciplines such as neuroscience, biology, psychology, education, and medicine (Caine & Caine, 1991). The Caines' twelve brain/mind learning principles are listed in Figure 2.1 below.

1. The brain is a parallel processor.
2. Learning engages the entire physiology.
3. The search for meaning is innate.
4. The search for meaning occurs through patterning.
5. Emotions are critical to patterning.
6. Every brain simultaneously perceives and creates parts and wholes.
7. Learning involves both focused attention and peripheral perception.
8. Learning always involves conscious and unconscious processes.
9. We have two types of memory: A spatial memory system and a set of systems for rote learning.
10. The brain understands and remembers best when facts and skills are embedded in natural spatial memory.
11. Learning is enhanced by challenge and inhibited by threat.
12. Each brain is unique.

Figure 2.1 Twelve Brain/Mind Learning Principles. Adapted from *"Making Connections: Teaching and the Human Brain,"* by R.N. Caine and G. Caine, 1994, p. 87-95. Copyright 1991 by R.N. Caine and G. Caine.

Employing the Caines' twelve brain/mind learning principles, professionals in education attempt to extrapolate the most recent research data on the brain and apply it to teaching and learning in pre-K-16+ schools. Literature suggests that using the results of

BBL research helps learners learn and helps teachers reach diverse learner populations (Connell, 2009; Farmer, 2004; Gulpinar, 2005). BBL includes and combines specific types of research-based academic interventions as well as applied aspects of emotional learning (Connell, 2005; Gulpinar, 2005). Additionally, BBL research affirms that each student has his or her own learning style and that teachers can reach students by including aspects of BBL such as multiple intelligences, learning styles approaches, differentiated instruction, multisensory approaches to reading, writing, and math, and left-brain/right-brain learning strategies. Literature suggests that students achieve more in a shorter amount of time when teachers know how to teach to students' individual learning styles and that there is a need for diverse learning experiences in the classroom (Connell, 2005; Madrazo, Jr. & Motz, 2005; Zadina, 2008). In addition to BBL research, as it pertains to regular, diverse pre-K-16+ classrooms, and to special education, it can also be applied to second language learning.

Implications for Second Language Learners

Although BBL was initially formulated to improve the educational experience of native speakers, language educators have taken the Caines' twelve principles of BBL and have applied them to ESL. Lombardi (2008) takes the view that nontraditional approaches to learning address the varied needs of English language learners (ELLs) and that these approaches improve their confidence and skills. Additionally, in discussing the Caines' twelve BBL principles, she suggests ways to implement them in the ELL classroom. Lombardi suggests frequent activity shifts, cooperative learning, providing rationale through real life context and activities; exploiting prior knowledge for

patterning to occur by pre-teaching, modeling and rehearsing key concepts, skills and terms; providing a warm, supportive, non-threatening educational climate for successful learning outcomes; including both hemispheres, verbal and visual for meaningful learning; teacher awareness of focused and peripheral perception, conscious and unconscious processes.

Morse (2004) writes specifically about the needs of adult language learners. She has noted through teaching Greek to adult graduate students, that traditional methods of sitting at tables or desks, listening to a lecture, practicing translation exercises, tutoring by CD, and taking quizzes and tests, do not translate well to deep learning. She has learned, through trial and error, that BBL is relevant to language learning in that it emphasizes that adults learn best through repetitive pattern-making associations, which move from familiar to more challenging information, in which they are active participants as problem solvers in a social setting. Knowledge is stored in patterns of connections and the strength of these patterns of connections determines the accessibility of retrieval. The more the patterning happens, the stronger the recall. Patterns are built on the unique networks established from each person's particular past experiences. In this way, learning is constructed on a person's particular past experiences; it does not happen through instruction, but through connection-making with previous established networks. Consequently, Morse has adjusted her teaching techniques so that they include texts that have relevance to students' lives, empower students with insights on adult learning and metacognition, feature student centered learning activities, and develop a social learning environment in her classroom.

Along with Morse, other researchers have suggested the importance of context in language learning. They agree that for best comprehension and long-term memory, students must be able to relate what they are learning to their own lives (Danesi, 2003, Morse, 2004; Sousa, 2006; Wolfe, 2010). Given past living/learning experiences of the adult ESL learners in this study, this point seems most salient. Teaching through the use of print and lecture does not always engage these learners whose past learning experiences are primarily traditional in the sense that their education has consisted of learning practical household skills, farming techniques and traditional values at home by watching and doing. BBL has a lot to offer in terms of alternative teaching strategies to reach diverse learners. Of great interest to this researcher are brain-based left-brain, right-brain, whole-brain learning strategies.

Left-Brain, Right-Brain, Whole-Brain

A fundamental premise of teaching to hemisphericity is the practice of systematically balancing teaching activities that equally address linear and holistic thinking. The most widely researched and cited characteristics used to describe linear thinking are: verbal, digital, sequential, rational, and logical. For holistic thinking, the following terms are used: nonverbal, visual-spatial, simultaneous, analogical, and intuitive (Springer & Deutsch, 1993 as cited by Nicoll-Senft & Seider, 2010).

One of several brain-based teaching strategies, left-brain, right-brain, whole- brain learning, developed in tandem with the theory of hemispheric dominance (Connell, 2005). In the late 1970s and early 1980s as more and more neuroscience research was published about brain hemisphericity, educators became interested in the

different but complementary processing modes of the hemispheres of the brain, and began to apply their interpretations of the findings to their teaching methods (Williams 1983; Wolfe, 2010). Some educators believed that past teaching techniques taught to left hemisphere dominance and excluded teaching to the right hemisphere. They felt that there was a need to incorporate integrated hemispheric processing into the curricula (Farmer, 2004; Luvaas-Briggs, 1984; Williams, 1986). Moreover, lectures, books, workbooks, copied worksheets, all considered left hemisphere dominant teaching tools, needed to be paired with approaches that would enable students to see patterns, make use of visual and spatial thinking and deal with the whole as well as the parts (Gensee, 2000; Williams, 1986). The goal, then, was to balance verbal techniques with visual strategies, objective language with evocative, and to pair the use of nonlinear metaphor, direct experience and multisensory learning with linear textbook presentations (Williams, 1986).

At this point in the discussion, a caveat is in order. In the 1970s and 1980s, along with the theory of a more balanced approach to teaching , came "dichotomania" – a kind of unbridled enthusiasm for our "two brains" (Alferink, 2010; Caine & Caine,1994; Springer & Deutsch, 1998; Williams, 1983; Wolfe, 2010). Many dichotomies were assigned to the two hemispheres – art and science, reason and intuition, cognition and emotion. Even today, these dichotomies, or "neuromyths," persist somewhat in the general public and among some teachers (Danesi, 1994; Danesi, 2003; Williams, 1983; Wolfe, 2010). There has been a tendency for educators to misinterpret and/or to oversimplify neuroscience research. Exaggerated claims have been made, especially

about the benefits of right-brain educational models. More recent literature suggests that these models are: (1) potentially damaging to students, especially special needs students; (2) far removed from actual scientific research; and (3) products of social trends. (Alferink; 2010; Danesi, 2003; Gardner, 2004; Gensee, 2000; Springer &Deutsch, 1998; Wolfe, 2010). Most recent research and literature suggests that teachers need to teach to the whole brain, not to one part, and to the many differing learning styles in the classroom (Wolfe, 2010).

Current Theories and Studies

Certainly more collaboration between researchers and educators needs to be done. However, as neuroscientists continue to find more accurate ways to measure brain functions, educators have found applications to the classroom and have developed new teaching/learning strategies. Rather than fixating on unimodal techniques such as right-brain learning, educators now stress the importance of engaging their students' whole brains (Danesi, 2003; Farmer, 2004; Luvaas-Briggs, 1984; Wolfe, 2010). Farmer (2004) recommends that teachers can design learning activities that build on students' natural strengths, but also improve their less-favored brain hemisphere. Furthermore, she stresses that since each classroom is filled with students having differing brain characteristics, the wisest choice is to plan curriculum that supports both sides of the brain. Luvaas-Briggs (1984), concurs by writing that the teacher's goal in the classroom should be to integrate the strengths of both hemispheres. Teachers can facilitate learning by promoting "complementary hemispheric interaction"– by offering our students more than one cognitive approach to learning new material. In her discussion of

hemisphericity, Wolfe (2010) proposes that we teach to both halves of the brain since they work together all of the time, and that we need to teach content within a context that is meaningful to students by connecting it to their own lives and experiences. That is, teaching to both halves of the brain. She goes on to state that too often, students never comprehend the "big picture" of how the content they learn fits into the larger scheme of things.

While it is difficult to find on the topic of hemisphericity and learning preferences, peer reviewed research does exist in the area of the 4MAT system of teaching. Although not specifically developed to apply to second language learning, it has shown success in other teaching areas. Developed by McCarthy (1980), 4MAT is an eight step, whole-brain instructional method that integrates student diverse learning styles (imaginative, analytical, common sense, and dynamic) with right-brain and left-brain processing preferences. It has recently been used in a study of long-term memory by students attending accounting classes in vocational high schools in Taiwan. Pre- and post-tests were administered; the results showed better retention and engagement for the treatment group using the 4MAT whole-brain teaching method over a control group (Lee & Hung, 2009). Wilkerson and White (1988) compared textbook teaching to using the whole-brain 4MAT system in a study with third-grade students learning a science unit. In post-testing, the 4MAT group showed greater achievement in content knowledge, comprehension, application and analysis than those in a control group.

Second Language Acquisition

Several researcher-educators have focused studies specifically on second language acquisition and the interconnectedness of the right and left hemispheres of the brain. SLA researchers Danesi and Mollica have seen successful results in a research study testing their *Bimodality Theory* and *Modal Flow Principle* (Danesi & Mollica, 1988; Danesi, 2003). Danesi and Mollica use the terms *Bimodal, R-Mode (RM)* and *L-Mode (LM)* to describe second language acquisition processes. RM refers to processes that have a primary locus in the right hemisphere but which activate other areas of the brain in an interconnected fashion**.** Likewise, LM refers to functions in the left hemisphere, which also activate other areas of the brain in a similarly interconnected fashion. Bimodality refers to teaching techniques that activate the RM and LM in an integrated fashion. Danesi and Mollica assert a Modal Flow Principle by which new information is acquired in a right to left " flow." New input is learned more efficiently when the learner's brain is allowed to process it in terms of an RM (experiential/contextual) to LM (analytical/conceptual) flow. A third intermodal step completes the learning process when RM and LM are combined in a performative task (Danesi, 2003). In Danesi and Mollica's 1988 research study, an experimental group of students at the University of Toronto studying beginning Italian for nonnative speakers was given bimodal instructions while two control groups were instructed in either LM dominant techniques or RM dominant techniques. It was found that the bimodal group performed better in overall achievement (Danesi, 1994; Rivera, 1998). The bimodal/modal flow principle may be significant to the learners in the current study

because it integrates experiential/contextual with analytical/conceptual teaching approaches.

Sousa (2006) adds that communicative competence requires the integration of four major competencies (Canale & Swain, 1980; Canale, 1983). These competencies require verbal and nonverbal aspects of language as well as right and left-hemispheric processing. According to Sousa, grammatical competence requires the analytic and sequential processing of the left hemisphere. Sociolinguistic competence involves the right hemisphere's ability to contextualize language differences. Discourse competence is the ability to combine form and thought into coherent expressions. This requires the integration of both hemispheres to create the grammatical forms and the right hemisphere's ability to synthesize them into meaningful, coherent wholes. Strategic competence is the ability to use verbal and nonverbal communication strategies, such as body language and circumlocution, to compensate for the learner's imperfect use of L2 to negotiate meaning. Relevant to the participants in the present study, Sousa suggests the need for teachers to ensure the nonverbal forms of comprehension in second language acquisition; that teachers should work with contextual language, trial and error, brainstorming meaning, visual activities, and role-playing.

Reiterer, Pereda and Bhattacharya (2009) recently studied how hemispheric involvement differs according to the proficiency level of second language speakers. In this study, they hypothesized that different L2 proficiency groups have different brain activation in terms of lateralization and hemispheric involvement. To test their hypothesis, researchers used EEG-synchronization techniques for measurement.

Participants in the study were German university students studying English as a foreign language. All participants were right-handed females; 19 of high L2 proficiency and 19 of low L2 proficiency. Results supported the researchers' hypothesis: Second language learners in their initial phases of learning L2 or bilinguals with poor fluency and less experience relied more on RH areas of the brain when processing their L2. One possible conclusion drawn from this study is that the RH houses more holistic learning strategies (Reiterer, Pereda & Bhattacharya, 2009). Germaine to this study is the idea that low-level, low-literate ESL learners may benefit from holistic, RH learning activities especially in initial phases of L2 learning.

Common Ground?

Whether researched or theorized, the literature reviewed so far, has revealed some common ground. That common ground appears to be that teachers need to utilize a variety of techniques and materials to reach their students, all of whom have different life experiences and learning styles . Additionally, the " big picture" or holistic approach should be integrated into the educational experience so that more learner engagement and overall comprehension can occur. Teaching techniques that utilize prior knowledge to build on learners' past life experience help to establish deep learning. And finally, the two brain hemispheres are both engaged in an integrated fashion, processing the same stimuli in different ways.

A Need for More Research

It appears that, at least in the few studies this researcher has found, learners that are given a variety of RH and LH learning experiences out-perform control groups taught

by a unimodal approach. However, more research involving hemisphericity and its impact on learning styles and educational outcomes needs to be done. In fact, no literature specifically related to low-level, low-literate adult ESL learners and the application of BBL, left-brain/right-brain/whole-brain, bimodal/modal flow, or 4MAT teaching techniques has been found for this study. Furthermore, the importance of low-level, low-literate students' past learning experiences and how those experiences could be tapped to promote L2 acquisition has not been adequately explored. This study will engage low-level, low-literate adult ESL learners in direct experience, right-brain associated learning activities in addition to the use of a required textbook. In this way, this researcher hopes to find a teaching/learning balance that addresses hemispheric preference and whole brain learning in the ESL classroom. With this in mind, the questions guiding this research are: (1) Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language learners? (2) With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve learning? (3) Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach?

Summary

In this chapter I have reviewed the current literature concerning neuroscience research, brain-based learning and its adjunct right-brain/left-brain/whole-brain learning, bimodality/modal flow principle, and the 4MAT system as well as implications for low-level, low-literate adult ESL learners. A current gap in the literature has been found on

the topic of low-level, low-literate adult ESL learners and the possible application of any of the above teaching/learning techniques. In Chapter One, I discussed the tendency for textbooks to be geared toward left-brain associated learning and that they might be supplemented with right-brain associated learning activities for improved learner engagement and better comprehension of L2. Through this study, I intend to enrich low-level, low-literate adult learners' second language learning experiences in my classroom by including right-brain associated learning activities to achieve a hemispherically balanced curriculum. I want to find out whether these activities do, in fact, improve learner engagement and comprehension. Chapter Three will describe the methodology that will be used to find the answers to the questions addressed in this study.

CHAPTER THREE: METHODOLOGY

In order to achieve a more balanced teaching curriculum in my classroom, this study is designed to explore the integration of right-brain associated learning activities with a left-brain focused textbook teaching approach. With this in mind, the questions guiding this research are: (1) Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language learners? (2) With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve learning? (3) Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach? In this chapter, I describe the research paradigm, method, participants, learning environment, data collection techniques, assessment, and procedure used in this study.

Research Paradigm

To answer my research question, I use a qualitative action research approach. I believe my study fits the paradigm of qualitative research, which according to Dornyei (2007), involves data collection procedures that primarily result in open-ended, non-numerical data which is then analyzed mainly by non-statistical methods. Qualitative data seeks to find the meaning, not frequency of naturally occurring events. This research process is not restricted by a pre-conceived hypothesis; instead, it is inductive and seeks to gather data to build theories rather than deductively test pre-determined hypotheses as in quantitative research. The study remains open, fluid, and flexible so that

it can respond to new information during the course of investigation. This flexibility may even apply to the research questions. They may evolve, change, or be refined during the study (Dornyei, 2007; Merriam, 2009). The current study fits this paradigm because it attempts to discover how a specific group of low-level, low-literate L2 language learners learn best. Specifically, the study is designed to find out whether the addition of right-brain associated learning activities to a left-brain focused textbook approach to teaching will positively engage and facilitate greater comprehension for low-level, low-literate adult second language learners.

Action Research

The method I have chosen for investigation is action research, a form of applied research. Action research addresses specific problems within a specific setting and involves the participants who want to find solutions to problems within that setting. Action research involves action, in that it seeks to bring about change in a local educational context. It is research because it involves the collection and analysis of data. It is also participatory and collaborative in that teachers work together and/or with their students to examine their own classrooms. They then try to find ways to improve their own teaching (Jones, 1998; McKay, 2006; Merriam, 2009). The current study fits the action research paradigm because it explores the possibility of a curriculum change in the classroom. In my classroom I have found that a lecture/text-book approach to teaching low-level, low-literate adult ESL learners does not bring about sufficient engagement and comprehension. Specifically, Karen learners in my classroom have little experience with a formal learning environment as well as with print. This study explored the possibility

that the addition of right-brain associated learning activities to the use of a textbook in the classroom would prove to be engaging and helpful to L2 comprehension .

Participants and Location

The participants in this study were low-level, low-literate adult ESL learners who studied English twenty hours per week in a low-beginning level class. Classes were held Monday through Thursday from 9:00 A.M. to 2:15 P.M. That time period included two ten minute breaks and a twenty-five minute lunch period. The majority of learners, primarily Karen refugees from Burma and Thailand, had little to no formal L1 education. The class size ranged from twelve to eighteen learners per day; fourteen learner/participants completed the study. The learners included twelve Karen speaking adults from Thailand and/or Burma, one Burmese speaker from Burma, and one Vietnamese speaker from Vietnam. They ranged in age from twenty-three to sixty-two years. Six men and eight women participated. (See Table 3.1 below for more detailed information).

This study took place over a period of one month at an adult ESL learning and social services center in a large metropolitan area in the upper Midwest. Although a variety of ethnic groups are represented at the learning center, at the time of this study, the majority of learners at the center were Karen refugees from Burma and/or Thailand. Most of the learners had resided in the United States for one year or less. Research was conducted with a group of low-beginning learners, during class time, by me, the teacher, in my classroom.

Data Collection Techniques

To answer my questions, I used three data collection techniques. These collection techniques consisted of gathering (1) participant demographic information, (2) learner

Table 3.1

Participant Demographic Information

Student	Country of Origin	L1	# of Years of L1 Education	Date of arrival in the U.S.A.	Date of arrival in MN	Gender	Age in years
PS	Burma	Karen	0	11/13/2007	same	Male	62
NM	Burma	Karen	0	7/13/2011	same	Female	40
ES	Burma	Karen	2	7/5/2011	same	Female	42
PP	Burma	Karen	2	10/27/2010	same	Female	39
DD	Burma	Karen	8	2/28/2012	same	Female	23
PIP	Burma	Karen	0	12/3/2009	2/25/2011	Female	29
LW	Burma	Karen	0	12/7/2011	same	Male	25
MC	Burma	Burmese	5	7/26/2011	same	Female	30
HH	Burma	Karen	8	9/9/2010	same	Male	26
ELP	Burma	Karen	3	9/28/2011	same	Female	31
PW	Burma	Karen	0	2/7/2011	same	Male	35
TN	Vietnam	Vietnamese	12	2/24/2012	same	Female	51
KP	Burma	Karen	6	7/12/2011	same	Male	56
TK	Burma	Karen	0	10/27/2010	same	Male	44

impressions of right and left-brain focused learning activities, and (3) observer/participant impressions of learner engagement and comprehension.

Demographic Information

Demographic information was gathered orally from participating individuals as well as from school files. Because gathering information from low-level, low-literate ESL learners in an interview or by questionnaire is difficult, at best, individual school

files were used with participant permission to gather demographic information such as formal educational background (L1, L2), literacy level, age, gender, nationality, time spent in the United States, and date of arrival in Minnesota. This information remained anonymous in publication. (See Appendix A for a copy of the data collection instrument).

Learner Feedback/Self-Assessment Questionnaires

Learner feedback/self-assessment questionnaires were used to gather students' impressions immediately after a particular activity or lesson (Freeman, 1998). Did they enjoy a particular learning activity? Did they feel that they had learned something? The feedback/self-assessment questionnaires remained anonymous to insure validity. (See Appendices B, C, D, E and F for copies of the learner feedback/self-assessment collection instruments).

Class Observation/Field Notes

Class observation was done and field notes were taken by me, the teacher, as an observer participant (Freeman, 1998). Observation and note taking took place during selected right-brain and left-brain focused learning activities at regular intervals. The field notes provided information concerning learner participation and engagement, verbal and nonverbal information (behavior), interactions among participants, and demonstrations of learner comprehension. Last minute changes, unexpected problems or outcomes, and a list of the students who attended class were provided (Freeman, 1998). **(**See Appendices H and I for copies of the class observation field notes collection instruments).

Procedure

During this action research project, all data collection was done in the classroom during normal class time. I first gathered participants' demographic information from individual student files. This data told me who the participants were in my study, their nationalities, where they came from, how long they had lived in the United States, when they came to Minnesota, and their educational backgrounds. In the course of the study, right-brain associated learning activities were presented to the participants as alternative learning tools to the more linear left-brain focused learning activities within a given textbook.

I used a direct experience teaching approach for right-brain associated learning activities. Experiential learning provides learners with a meaningful whole and challenges them to discover its parts and their relationships to each other (Williams, 1983). For learners who may not be print oriented, in this case, low-level, low-literate learners who come from a traditional, hands on approach to learning, I felt that experiential learning was much more likely to engage them and to bring additional and more integrated comprehension into the learning process (Luvaas-Briggs, 1984; Mekong, 2008; Williams, 1983). Experiential learning activities include simple field trips such as mapping the school's neighborhood, going to the grocery store for comparison shopping, providing realia in the classroom such as clothing, home health care objects and remedies, kitchen utensils, and role-playing (Luvaas-Briggs, 1983; Williams, 1983). Theme-based, experiential learning activities in this study centered around clothing and shopping. An accompanying textbook unit (*Ventures Basic*, Unit 7, Shopping,

Cambridge University Press, 2008) also focused on clothing and shopping. While textbook learning activities focused on left-brain associated reading and writing skills, the experiential learning activities focused on right-brain associated activities such as manipulation of real life objects (clothing) and role-playing practical life situations such as shopping for clothing. Right-brain associated learning activities encouraged group interaction ; left-brain associated learning activities focused on independent learning.

Right-Brain and Left-Brain Associated Learning Activities

In order to collect pertinent data for analysis, the learners in my classroom took part in two left-brain and two right-brain associated learning activities. Right-brain associated activities focused on context, direct experience, visual/spatial thinking, and socialization. In contrast, left-brain associated activities focused on more abstract learning skills such as decoding text without visual aids, and independent, sequential thinking. Immediately following each learning activity, the learners rated how well they liked it as well as whether or not they thought it promoted learning. The ratings were written on feedback/self-assessment questionnaires. I, as teacher/observer/ participant observed the learning activities as they unfolded. I looked for specific behaviors of learner engagement and comprehension and used my own rating scale to record those behaviors. I also took anecdotal notes.

Right-brain associated learning activity #1: Name the clothing items in the bag.

The goal of this learning activity was to reinforce verbal and written learning techniques with visual/spatial stimulation through the use of real objects, direct physical experience, and group interaction. Real objects are concrete and some students, such as

those in this study, may need the concrete to learn (Danesi, 2003; Luvaas-Briggs, 1984; Williams, 1983; Zadina, 2008). Talking or reading about a subject at this learning level does not always bring about meaning. In this learning activity, small groups (three to four participants) of learners were given bags of clothing items. They used picture dictionaries to find the word to match each given item. Then, they wrote a list of the items they had in the bag and presented a "show and tell" to the class. This activity demonstrated vocabulary comprehension through the use of realia and pictures rather than through the exclusive use of verbalization and print.

Right-brain associated learning activity #2: Role play of shopping for clothing.

Role-playing creates an experience in the classroom. In addition, when role-playing, learners take on the roles of other people in a specific context, and try to act as those people would in that context. The goal of this learning activity was to place learners in the context of a real life situation, that is, shopping for clothing. During this activity, learners practiced asking a store clerk for specific clothing items of a specific size and color. Through this activity, learners demonstrated understanding by using information within a situation of real life experience. They could not simply store it or repeat it back (Williams, 1983).

Left-brain associated learning activity #1: A word scramble. To reinforce spelling and word identification, learners were given a list of familiar scrambled vocabulary words to unscramble and write out correctly. In this learning activity, learners were exposed to and worked with print only. This left-brain associated learning activity as well as crosswords, word searches, word mazes and cryptograms help to promote and reinforce

control of spelling and vocabulary through a recreational problem solving format (Danesi, 2003). See Appendix G for a copy of the Word Scramble collection instrument.

Left-brain associated learning activity #2: Life skills reading. Using print only, learners demonstrated independent, text based, sequential thinking to read and understand a receipt from a clothing store. They then used the information to answer multiple-choice questions concerning money, clothing item names, a phone number and a store name. Page 94, *Ventures Basic Student's Book* was used as a collection instrument (Bitterlin, Johnson, Price &Ramirez, 2008). (See Appendix F for a copy of the life skills reading collection instrument).

During the course of research, feedback/self-assessment questionnaires were used to gather impressionistic data. Done in English with an interpreter, the questionnaires were filled out by the learner participants immediately following selected right-brain and left-brain associated learning activities. This data retrieval method was used to collect learner self-impressions of engagement and learning. A possible drawback to the use of participant feedback and self-assessment was that they were self-reporting and may not have accurately reflected activity likability or learning. Learners may have wished to please the teacher rather than accurately report whether or not they liked a learning activity or understood it. The use of an interpreter was necessary to help the learners in this study understand and complete the questions. Additional assessment was done by the teacher as an observer/participant. Impressions of participant engagement and demonstration of participant comprehension were recorded in rated field notes as well as anecdotally.

Data Analysis

I analyzed my data by discovering and categorizing demographic data and educational histories of the participants in this study. I then created a table for organizing the data. For my analysis of learner engagement and comprehension, I used data from learner feedback/self-assessment questionnaires as well as data from my own observer/ participant field notes. To analyze my field notes, I developed a rubric and rating scale (O'Malley & Valdez Pierce, 1996). The field note rubric rated engagement and comprehension. Engagement was defined as staying on task, showing interest in learning activities, exhibiting interaction with team members in a group or partnered learning environment, and the ability to pursue a difficult learning task without becoming frustrated. Comprehension was defined as understanding instructions, being able to begin an activity, being able to help a teammate if asked, being able to complete an assignment and to successfully complete the required tasks. Finally, I analyzed and compared the data gathered from both participant and observer sources. (See Figures 4.1 and 4.2 and Tables 4.2 and 4.3 in Chapter Four for analyses and comparisons). Through my data analysis, I wanted to find out if the learners liked and valued both right-brain and left-brain associated learning activities or if they had a preference. I also wanted to compare my impressions to theirs. Was there congruity? Finally, did I and the learners think a combination whole-brain approach to learning a second language was the preferred approach?

Verification of Data

In order to help insure internal validity and reliability of findings for this study, I used two sources from which to collect data and two methods of collection.

First, the two sources from which I collected data were my own observer impressions of successful engagement and comprehension as well as the learners' impressions. The two methods of collection were learner feedback/self-assessment questionnaires and my own observation field notes. In this way, a balance of impressions was reached through the use of two different groups involved in the study as well as two different methods of data collection.

Ethical Issues

In order to protect participants' rights, all participants remained anonymous during the research study and in the published findings. All written materials that identified the participants were kept in a locked file and destroyed upon publication. Written permission was obtained from the participants and the participants were informed of the nature of the process of the research study before research began. Letters of permission were read to the participants in Karen and Burmese. At any time a participant decided not to participate in the study, there were no negative repercussions as a result of such a decision. Transcriptions were verbatim, not paraphrased. Furthermore, I approached my study without bias, as much as possible, and tried to remain objective throughout.

Conclusion

In this chapter I described the methods I used to collect and analyze the data. I described how I would validate the data and findings, and how I would approach ethical issues. The next chapter presents the results of this study.

CHAPTER FOUR: RESULTS

In order to achieve a more balanced teaching curriculum in the classroom, this study was designed to explore the integration of right-brain associated learning activities with a left-brain focused textbook teaching approach. With this in mind, the present study took place at an urban, adult ESL learning center in the upper Midwest. The participants in the present study included fourteen adult low-level, low-literate ESL learners. Twelve of the participants were Karen speakers from Burma, one was a Vietnamese speaker from Vietnam, and one was a Burmese speaker from Burma. Of the study participants, eight were females and six were males. Their ages ranged from twenty-three years to sixty-two years. Formal L1 education in the participants' country of origin, or from Thailand in the case of some Karen refugees, ranged from zero to twelve years. Eleven of the participants completed six years or less of formal L1 schooling. (See Table 4.1 for detailed participant demographic information).

Data were collected using a qualitative action research approach and research was done in a classroom during regular classroom hours. The participants took part in two right-brain and two left-brain associated learning activities; collection instruments included learner demographic information, learner feedback/self-assessment questionnaires, and my observation/field notes . Questions guiding this research were: (1) Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language

learners? (2) With the addition of right-brain associated learning activities, do learners feel more engaged and do they think these activities improve learning? (3) Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach?

Table 4.1

Participant Demographic Information

Student	**Country of Origin**	**L1**	**# of Years of L1 Education**	**Date of arrival in the U.S.A.**	**Date of arrival in MN**	**Gender**	**Age in years**
PS	Burma	Karen	0	11/13/2007	same	Male	62
NM	Burma	Karen	0	7/13/2011	same	Female	40
ES	Burma	Karen	2	7/5/2011	same	Female	42
PP	Burma	Karen	2	10/27/2010	same	Female	39
DD	Burma	Karen	8	2/28/2012	same	Female	23
PIP	Burma	Karen	0	12/3/2009	2/25/2011	Female	29
LW	Burma	Karen	0	12/7/2011	same	Male	25
MC	Burma	Burmese	5	7/26/2011	same	Female	30
HH	Burma	Karen	8	9/9/2010	same	Male	26
ELP	Burma	Karen	3	9/28/2011	same	Female	31
PW	Burma	Karen	0	2/7/2011	same	Male	35
TN	Vietnam	Vietnamese	12	2/24/2012	same	Female	51
KP	Burma	Karen	6	7/12/2011	same	Male	56
TK	Burma	Karen	0	10/27/2010	same	Male	44

In this study, participants were presented with both right-brain and left-brain associated learning activities. Right-brain associated activities included holistic, direct experience learning tasks in which the participants manipulated real objects and practiced dialogue in real life social situations. Left-brain associated activities included independent, linear, sequential learning. In these activities, the participants practiced

spelling and reading comprehension. Right-brain associated activities were group and partner oriented. Left-brain associated activities were designed for the individual learner.

Data Collection

Four learning activities took place in the participants' regular classroom, during the first hour of class, in the time span of two weeks in May, 2012. Each activity took less than one hour for the participants to complete. On completion of each learning task, participants were asked to fill out a questionnaire that was constructed to reflect how much they liked the activity and how much they thought they had learned from the activity. As the classroom teacher, my role was that of researcher/observer/participant. (See appendices B, C, D and E for right-brain and left-brain focused learning activity questionnaires). During each activity, I rated the participants' behavior relative to engagement and comprehension with a rubric. I also took anecdotal field notes to describe these behaviors. A Karen speaking interpreter was recruited to help the participants understand the directions and content of the questionnaires. However, the interpreter was not available for the first of four learning activities. Both a classroom aide and I answered any questions the participants had while performing the learning tasks as well as while filling out the questionnaires. (See appendices H and I for observation/field notes rubrics).

Learning Activities

Right-brain activity #1, May 15, 2012: Name the clothing items in a bag. The goal of this learning activity was to reinforce verbal and written learning techniques with visual/spatial stimulation through the use of real objects. In groups of three, participants,

with the use of a picture dictionary, identified ten clothing items, wrote a list of those items, and then orally reported their findings to the class.

Left-brain activity #1, May 21, 2012: Word scramble. This was an individual learning task in which participants were given a list of twelve scrambled clothing vocabulary words to write in correct spelling order. (See appendix G for list of scrambled words).

Left-brain activity #2, May 23, 2012: Life skills reading. This was an individual reading comprehension learning task in which participants read a clothing store sales receipt and then answered comprehension questions about the information on the receipt. (See appendix H for copy of reading sample).

Right-brain activity #2, May 25, 2012: Role-play. In a partnered learning task, participants practiced a dialogue for making a request for a specific clothing item in a specific color. One participant made the request while her partner found and delivered the requested item of clothing. Real clothing items were used in this learning activity.

Findings

Results for Question One

To answer the question, "Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language learners?" data from the my observations and field notes were compared with perceived and actual data collected from the participants' work sheets (when applicable) and feedback/self-assessment questionnaires. It was found that in both right-brain and left-brain associated learning activities, all of the participants correctly completed the assigned tasks.

Results for right-brain associated learning activities. Ratings of engagement, likeability, and comprehension for right-brain associated learning activities by both the participants and the observer can be seen below in Figure 4.1. Participant questionnaire feedback responses indicated that 97% of the study participants liked right-brain associated learning activities. According to my observations, 100% of the participants appeared interested and engaged in those learning activities. Participant questionnaire self-assessment responses for right-brain associated activities indicated that individual participants self-assessed, percentage-wise, lower than they actually performed in groups or pairs. 87% of the individual learners said they could identify clothing items and clothing colors whereas in group presentations or partnered dialogues, it was observed that they identified the same clothing items and colors successfully 100% of the time. In my anecdotal impressions, I noted that right-brain associated learning activities were accompanied by participant physical activity (learners moving around the room), talking and laughing. Some participants voluntarily took on leadership roles in group activities. In pair activities, it was observed that all partners took on assigned roles.

Results for left-brain associated learning activities. Ratings of engagement, likeability, and comprehension for left-brain associated learning activities by both the participants and the observer can be seen in Figure 4.2

Results for Questions Two and Three

To answer the questions "With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve

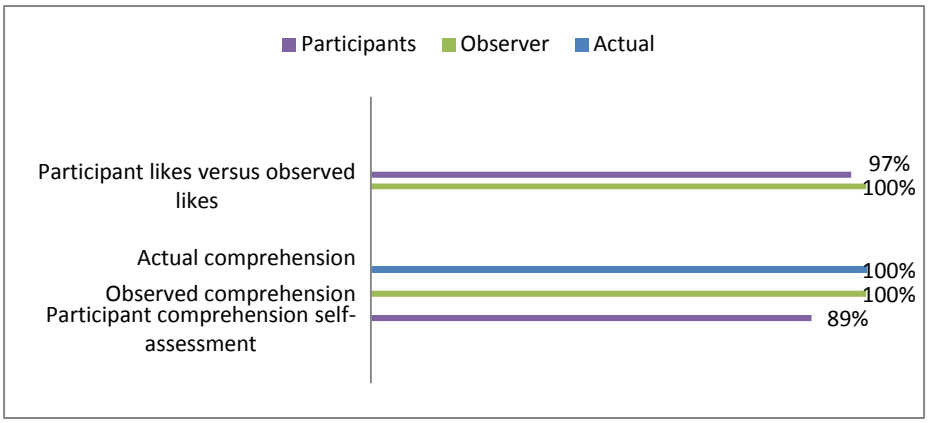

Figure 4.1. Participant and observer ratings for left-brain associated learning activities. Likeability and comprehension percentages shown.

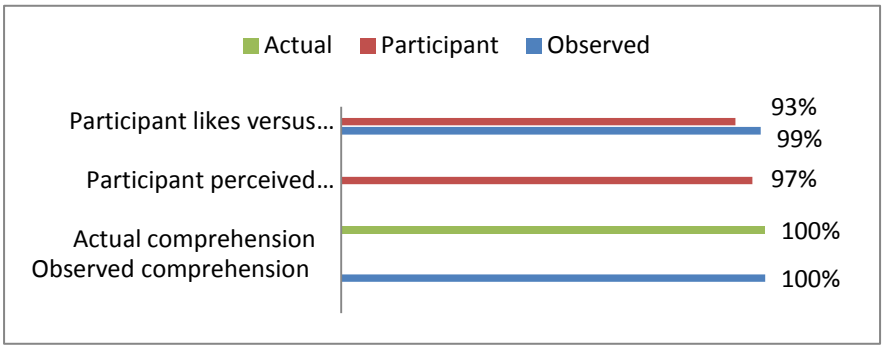

Figure 4.2. Participant and observer ratings for left-brain associated learning activities. Likeability and comprehension percentages shown.

learning?" and "Overall, are learners satisfied with a combination right-brain, left-brain, whole brain learning approach?," I first compared questionnaire feedback responses for likeability of right-brain and left-brain associated learning activities. As seen in Figures 4.1 and 4.2, participants rated both types of learning activities similarly. 97% of the

participants liked right-brain associated learning activities while 93% of the participants liked left-brain associated learning activities. 100% of the participants reported that right-brain associated learning activities improved learning.

Although the above data do not show a significant difference between right-brain and left-brain associated learning activity likeability and comprehension factors, participants indicated a considerable preference for group and pair work over independent learning. Participant questionnaire feedback responses showed that 86% of the participants liked to work in groups and 100% liked to work with a partner. None of the participants, or 0% liked to work independently. (See tables 4.2 and 4.3 for more detailed information). According to my observations, an average of 98% of the participants interacted with their group or partner during right-brain associated learning activities whereas an average of 87% of the participants were observed to work independently during left-brain associated learning activities. I also noted that during right-brain associated activities, an average 93% of the participants did not need help from the teacher. In left-brain associated activities, an average 91% of the participants did not need teacher help. (See Figure 4.3 for more detailed information).

Conclusion

In this chapter I presented the results of my data collection. Participant data were collected and presented to develop more detail about the participants' previous L1 educational experiences as well as length of residency in the United States, gender, and age. To answer my research questions, data from both right-brain and left-brain associated learning activities were presented from the analysis of participant

feedback/self-assessment questionnaires, my observation rubrics and anecdotal impressions. Percentages were extrapolated from raw data averages to show possible comparisons and contrasts between right-brain and left-brain associated learning activities in terms of likeability and comprehension. Additionally, data from participant questionnaires were presented to show whether or not the participants felt that right-brain associated learning activities helped them learn. Findings were shown in Tables 4.1, 4.2, and 4.3, and in Figures 4.1, 4.2, and 4.3. (See Appendices J, K, L, and M for additional raw data information).

Table 4.2

Percentages for participant likeability and perceived comprehension for right-brain learning activities.

Items	Responses in Percentages		
Right-brain associated learning activities	Yes	So-so	No
I like to practice buying clothes.	93%	7%	0%
I like to use real clothes to learn about clothes	93%	7%	0%
I like to use real clothes to learn about clothes	100%	0%	0%
I like to work with a partner.	100%	0%	0%
I like to work in a group.	86%	14%	0%
Working with real clothes helps me learn.	100%	0%	0%
I can find…I can ask for…	76%	N/A	N/A
Colors I know	91%	N/A	N/A

Note. N/A = not applicable

Table 4.3

Percentages for likeability, perceived comprehension, and actual comprehension for left-brain associated learning activities.

Item	Responses in Percentages		
Left-brain associated learning activities	Yes	So-so	No
I like to spell words.	93%	0%	7%
I like to read my textbook.	86%	14%	0%
I like to answer questions about what I read.	100%	0%	0%
I like to work by myself (read)	0%	14%	86%
I like to work by myself (spell)	0%	8%	92%
Words I know, self-assessment	97%	N/A	N/A
Words I know, actual	100%	N/A	N/A

Note. N/A = Not applicable

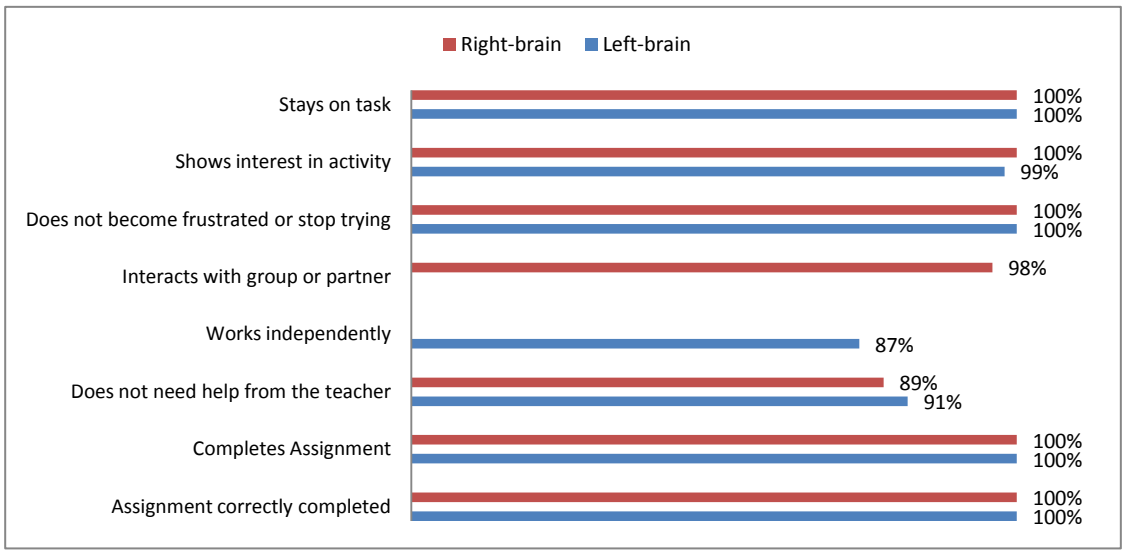

Figure 4.3. Observation results comparing participant behavior during right-brain and left-brain focused activities.

In this chapter I presented the results of my data collection. In Chapter Five, I will discuss my major findings, their implications, and suggestions for further research.

CHAPTER FIVE: CONCLUSION

In my classroom, I teach English as a second language to low-level, low-literate adult refugees, the majority of whom are Karen from Burma. Many of the learners have no previous experience with formal education in their first language. That being understood, engagement with and comprehension of a second language has not come easily to them, especially in a classroom where the use of print heavy teaching and learning tools is predominant. Because I have felt a need to find less traditional, more effective teaching methods, the focus of this study was to explore additional teaching options for the purpose of enriching and improving the learning experience of this specific group of learners.

In this study I attempted to answer the questions: Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult English language learners? With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve learning? Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach? In this chapter I will reexamine pertinent literature from Chapter Two and then address major findings from the current research, its limitations, implications for teachers and administrators and suggestions for further research.

Reexamination of the Literature

In a reexamination of the literature, current research has suggested that educators stress the importance of engaging their students' whole brains rather than fixating on unimodal techniques such as the exclusive use of either left-brain or right-brain learning strategies (Danesi, 2003, Farmer, 2004, Luvaas-Briggs, 1984, Wolfe, 2010). Since there is no scientific evidence that the two halves of our brains work separately, but that the two halves work together all of the time, in different ways (Alferink, 2010; Caine & Caine, 1991; (Danesi, 2003; Morse, 2004; Sousa, 2006; Springer & Deutsch, 1998; Wolfe, 2010) the literature has proposed that educators teach content within context that is meaningful to learners, that they balance left-brain associated teaching tools such as textbooks, worksheets and lectures with right-brain approaches that make use of visual and spatial thinking, direct experience, and hands on manipulatives (Farmer, 2004; Luvaas-Briggs, 1984; Morse, 2004; Sousa, 2006; Williams, 1986). In other words, combine a holistic cooperative teaching approach with the linear, sequential, more individualized " parts" approach (Gensee, 2000). Additionally, the literature has pointed out that teachers can design learning activities that build on students' natural strengths, but also improve their less-favored brain hemisphere by offering more than one cognitive approach to learning (Farmer, 2004; Luvaas-Briggs, 1984). And so, a combined right-brain/left-brain/whole-brain teaching approach may have a place in today's diverse classrooms, and specifically, in my case, in the ESL classroom (Danesi, 2003; Farmer, 2004). The results of the current study seem to support the literature, and next, I will discuss its major findings.

Major Findings

Summary of Findings

Overall, the adult ESL participants in this study self-reported and were observed to react positively to both right-brain and left-brain associated learning activities. Participant self-reporting and observations of engagement and comprehension in all learning activities were positive as well. The participants self-reported that right-brain associated activities helped them learn. Finally, the participants significantly preferred group and partner learning over independent learning.

Discussion

In this study, both anticipated and unexpected data emerged. First, in reference to the question "Does intentionally teaching to the whole brain positively affect engagement and comprehension of a second language for low-level, low-literate adult second language learners" participant self-reporting data showed engagement in both right and left-brain associated learning activities to be similar (97% RB vs. 93% LB). Observed ratings of engagement for right-brain and left-brain associated learning activities were also similar (100% RB vs. 99% LB). Participant self-reporting for comprehension showed less than a 10% rating difference between right and left-brain associated learning activities (89% RB vs. 97% LB), while observed ratings for comprehension were the same for both (100%). Participant perception of comprehension was lower for right-brain associated activities but that may be explained by the fact that one of those activities was the first in the series of four learning activities. At that time, the learner participants were not as familiar with clothing items and their associated

English terms as they were later in the study. Additionally, an interpreter was not present at that first learning activity. Altogether however, the findings seem to concur with the literature that a combination of both types of learning activities, or a whole-brain approach to learning may be valuable to this particular group of L2 learners.

In reference to the questions "With the addition of right-brain associated learning activities, are learners more engaged and do they think these activities improve learning? and " Overall, are learners satisfied with a combination right-brain, left-brain, whole-brain learning approach?, results of the current study suggest that the participants were similarly engaged in both right-brain and left-brain associated learning activities. This similarity was evident in both participant self-reporting and in observed ratings (self-reporting = 97% RB vs. 93% LB; observed ratings = 100% RB vs. 99% LB). However, there was a significant difference in self-reporting of engagement in terms of cooperative versus independent learning. In terms of likeability, participants self-reported no, or 0% engagement in left-brain associated independent learning activities whereas they reported 100% engagement for partner work and 86% engagement for group work.

These results are not surprising given the more informal, hands-on, cooperative learning approach previously experienced in Burma by many of the Karen learners who participated in this study (Infomekong, 2010; Karen Teacher Working Group, 2005; Morse, 2004; Nakashima & Vaddhahaphuti, 2006; The Peoples of the World Foundation, 2011). The results of this limited study seem to show that cooperative learning is valued significantly more than independent learning with this particular study group, primarily Karen.

As noted in Chapter Four, the participants in this study were observed talking to each other, helping each other, and even copying each other during left-brain associated, independent learning activities. In spite of these departures from genuine independent learning, it surprised this researcher that the participants learning styles appeared, as a group, more balanced than she had previously believed. It has been my bias that the study participants would much prefer right-brain associated learning due to their past, more informal educational experiences. In this study, that was not shown to be true. The participants self-reported that they liked left-brain associated spelling and reading activities almost as much as the right-brain experiential, hands on learning activities. These results suggest that the study participants were slightly more engaged in right-brain associated learning activities, but valued left-brain associated activities as well.

100% of the participants self-reported that right-brain associated learning activities (using real clothes helps me learn) helped them learn. The researcher observed that, indeed, the participants demonstrated positive learning results in right-brain associated performative tasks. It must also be noted that the participants demonstrated positive learning results, observed and actual (worksheets), while completing left-brain associated tasks as well. The positive results of both learning approaches lead this researcher to believe in the value of a whole-brain approach to teaching using both right-brain and left-brain associated teaching techniques. There were some obvious limitations to this study and, in the following section, I will discuss those limitations.

Limitations

The study sample for this action research project was small as there were only 14 learner participants. Additionally, a limited number of learning activities were planned over a short span of time. I believe the validity of this study was somewhat compromised by these factors. A similar study involving a greater number of participants, a longer period of time, and additional right-brain and left-brain associated learning activities may prove to be more valid, and perhaps, demonstrate different results. Somewhat to my surprise, I found the role of observer/participant rather difficult as I experienced frustration when the participant role distracted from the observer role. This distraction resulted in me not being able to focus on some participant behaviors during the study's learning activities. Ideally, if my role had been purely observational, with one or two classroom volunteers helping learners with directions and questions, my observational skills might have been more accurate.

Potentially compromising validity, an interpreter was not available for the first learning activity of the study. The participants in this study were low-beginning adult ESL learners with few second language verbal skills and little first or second language literacy. I believe they may have benefited from directions and explanations given in their first language for that initial learning activity. The three subsequent learning activities ran more smoothly, possibly because of the presence of an interpreter.

One last limitation of this study might have been the lack of control over the left-brain associated independent learning activities. I purposely did not intervene in left-brain associated activities when study participants assisted each other with their learning

tasks. My role was as an observer, and I wanted to find out whether or not the participants would, in fact, work alone. Had I enforced independent learning rather than allowing cooperative learning to occur during those activities, results may have differed, and that is another opportunity for further research.

Implications

According to the findings in this study, left-brain associated print dominant teaching techniques may be supplemented with more holistic, non-print learning activities to achieve a more balanced approach to reaching low-level, low-literate adult second language learners in a formal classroom environment. I have found, through this research project, that low-level, low-literate language learners appreciate a variety of learning activities, right-brain as well as left-brain, to fully engage in and comprehend the process of learning a second language. Since the participants in this study enjoyed right-brain associated learning activities, and felt that these activities helped them learn, I intend to routinely implement these learning activities into my curriculum this fall. Adding holistic, right-brain associated learning tools such as the use of realia (objects to look at and feel), photographs or pictures (preferably full color), field trips, cooperative learning tasks such as role-plays that mimic real life experiences, vocabulary acquisition through the use of flash cards on which learners have drawn word representational pictures, learner generated posters on which sentences or words may be represented by magazine pictures or learner generated art, diagrams, charts, graphic organizers, mind maps, manipulative materials such as spelling tiles or cuisenaire rods, games such as Junior Scrabble, and TPR, may help learners focus on the process of recognizing and

understanding patterns and general principles so that they can find meaning in specific facts (Connell, 2005; Danesi, 2003; Farmer, 2004; Reis, 2006; Sousa, 2006; Vinogradov, 2008; Williams, 1983).

In the coming school year, I plan to present my research findings to the administration and the other members of our teaching staff. I hope the presentation will encourage a lively discussion and brainstorming session that will produce interest in incorporating whole-brain teaching strategies at our school.

Further Research

It is my belief that the unique language learning needs of low-level, low-literate adult ESL learners has not been adequately addressed, through research, to this date. Adult students at this learning level are arriving at our school more than ever before, and additional research needs to be done to help them navigate their English language needs.

Although, through this study, I have found some success adding right-brain associated learning activities to my classroom curriculum, there are many other brain based learning theories to consider and research. Danesi and Mollica's modal flow principle could be fruitful for classroom research. The modal flow principle stresses that learning progresses from R-mode to L-mode and then finalizes in a combined performative task (Danesi, 2004; Danesi & Mollica, 1998). It would be interesting to design a study using that order of learning activities and compare the results to the more random right and left-brain learning activity order I used in the current study. Finally, I would like to study different ethnic populations to find out how different cultures react to

right and left-brain associated learning activities. How much does culture affect learning preference? How much is learning preference hard-wired in the brain?

To conclude, our understanding of the brain, through neuroscience research, is continually evolving and so our interpretation of the implications of findings from brain based research for teaching and learning should also evolve (Genesee, 2000). With this in mind, educators can gain insights from advances in brain research and make provisions for individual learning preferences in their classrooms. Furthermore, we, as teachers, can complement traditional methods of teaching by providing alternative learning activities, instructional materials, and grouping arrangements. Whether or not, or to what degree the brain's hemispheres influence learning preferences is yet to be determined. And, whether learning preferences be hard-wired or cultural, or both, it is my belief, that ESL teachers, in particular, need to address them in order to to provide our low-level, low-literate language learners an effective, balanced, whole-brain learning approach.

APPENDIX A

DEMOGRAPHIC INFORMATION ON STUDY PARTICIPANTS

Participant Demographic Information

Student	**Country of Origin**	**L1**	**# of Years of L1 Education**	**Date of arrival in the U.S.A.**	**Date of arrival in MN**	**Gender**	**Age in years**
PS	Burma	Karen	0	11/13/2007	same	Male	62
NM	Burma	Karen	0	7/13/2011	same	Female	40
ES	Burma	Karen	2	7/5/2011	same	Female	42
PP	Burma	Karen	2	10/27/2010	same	Female	39
DD	Burma	Karen	8	2/28/2012	same	Female	23
PIP	Burma	Karen	0	12/3/2009	2/25/2011	Female	29
LW	Burma	Karen	0	12/7/2011	same	Male	25
MC	Burma	Burmese	5	7/26/2011	same	Female	30
HH	Burma	Karen	8	9/9/2010	same	Male	26
ELP	Burma	Karen	3	9/28/2011	same	Female	31
PW	Burma	Karen	0	2/7/2011	same	Male	35
TN	Vietnam	Vietnamese	12	2/24/2012	same	Female	51
KP	Burma	Karen	6	7/12/2011	same	Male	56
TK	Burma	Karen	0	10/27/2010	same	Male	44

APPENDIX B

LEARNER FEEDBACK/SELF-ASSESSMENT QUESTIONNAIRE FOR RIGHT-BRAIN ASSOCIATED ACTIVITY #1 CLOTHING IDENTIFICATION

Read the sentence.

Circle: Yes So-So No

1. I like to use real clothing to learn about clothes.

   Yes So-So No

2. I like to work with a group of my classmates.

   Yes So –So No

3. Working with real clothes helps me learn.

   Yes So-So No

Read the sentences. Circle **Yes or No**

1. I can find a sweater.	Yes	No
2. I can find a dress.	Yes	No
3. I can find a jacket.	Yes	No
4. I can find a pair of pants.	Yes	No
5. I can find a shirt.	Yes	No
6. I can find a pair of shoes.	Yes	No
7. I can find a skirt.	Yes	No
8. I can find socks.	Yes	No
9. I can find a belt.	Yes	No
10. I can find a tie.	Yes	No

APPENDIX C

RIGHT-BRAIN ASSOCIATED LEARNING ACTIVITY #2

LEARNER FEEDBACK/SELF-ASSESSMENT QUESTIONNAIRE

ROLE PLAYING FOR SHOPPING AND CLOTHING

Read the sentences.

Circle: Yes So-So No

1. I like to work with a partner.

   Yes So-So No

2. I like to learn about clothing using real clothes.

   Yes So-So No

3. I like to practice buying clothes.

   Yes So-So No

Read the sentences. Circle Yes or No

1. I can ask for a T-shirt.	Yes	No
2. I can ask for a sweater.	Yes	No
3. I can ask for pants.	Yes	No
4. I can ask for a jacket.	Yes	No
5. I can ask for shoes	Yes	No
6. I can ask for a dress	Yes	No
7. I can ask for a skirt	Yes	No
8. I can ask for socks	Yes	No
9. I can ask for a blouse	Yes	No
10. I can ask for a tie	Yes	No

Circle the colors you know.

red	blue	orange	black	brown
yellow	purple	pink	green	white

APPENDIX D

LEFT-BRAIN ASSOCIATED LEARNING ACTIVITY #1

LEARNER FEEDBACK/SELF-ASSESSMENT QUESTIONNAIRE FOR WORD SCRAMBLE

Read the sentences.

Circle: Yes So-So No

1. I like to spell words.	Yes	So-So	No
3. I like to work by myself	Yes	So-So	No

Circle the words you know:

blouse	dress	jacket	pants	raincoat
shirt	shoes	skirt	socks	sweater
tie	t-shirt			

APPENDIX E

LEFT-BRAIN ASSOCIATED LEARNING ACTIVITY #2

LEARNER FEEDBACK/SELF-ASSESSMENT QUESTIONNAIRE

FOR LIFE SKILLS READING

Read the sentences.

Circle: Yes So-So No

1. I like to read my textbook.	Yes	So-So	No
2. I like to answer questions about what I read.	Yes	So-So	No
3. I like to work by myself.	Yes	So-So	No

Read the sentences. Circle Yes or No

1. I can read a sales receipt.	Yes	No
2. I can find the price for shoes.	Yes	No
3. I can find the price for a t-shirt.	Yes	No
4. I can find a store phone number.	Yes	No
5. I can find sales tax.	Yes	No

APPENDIX F

LIFE SKILLS READING

Lesson F Another view

1 Life-skills reading

The Clothes Place
271 Center Street
Tampa, Florida 33601
(813) 555-7200

Shoes.....$29.99
T-shirt.....$7.99
Subtotal: $37.98
Tax: $2.66
Total: $40.64

Thank you for shopping at
The Clothes Place.
Have a nice day!

A Read the sentences. Look at the receipt. Circle the answers.

1. The Clothes Place is a ____ .
   a. clothing store
   b. supermarket
2. The phone number is ____ .
   a. 555-0072
   b. 555-7200
3. The shoes are ____ .
   a. $19.99
   b. $29.99
4. The tax is ____ .
   a. $2.66
   b. $40.64

B Talk with a partner.

Where do you buy clothes?

APPENDIX G

WORD SCRAMBLE

Correct the spelling for each word.

Use the words in the box. Cross off the words as you use them.

socks	shoes	raincoat	skirt	blouse	
sweater	dress	pants	shirt	tie	jacket
t-shirt					

1. stnap __ __ __ __ __
2. ketcaj __ __ __ __ __ __
3. tirks __ __ __ __ __
4. sersd __ __ __ __ __
5. aocntiar __ __ __ __ __ __ __ __
6. weaters __ __ __ __ __ __ __
7. tirsh __ __ __ __ __
8. souble __ __ __ __ __ __
9. hoses __ __ __ __ __
10. ite __ __ __
11. oscks __ __ __ __ _ 12. tirsh - t __ __ __ __ __ __ __

APPENDIX H

TEACHER OBSERVATION FORM:

RIGHT-BRAIN ASSOCIATED LEARNING ACTIVITIES

Teacher Observation Form

Date: _____ Observer: _____

Start Time: _____ Finish Time: _____

Rating Scale: 1 = Inadequate, 2 = Poor, 3 = Good, 4 = Excellent, NA = Not Applicable

Right-brain learning activity: Identifying clothing items and matching them with words in the Basic Oxford Picture Dictionary/ Role Play Activity

Learner	1.	2.	3.	Comments Learner #1	Comments Learner #2	Comments Learner #3
Stays on task						
Shows interest in group activity						
Does not become frustrated or stop trying if activity is difficult						
Performs assigned role						
Interacts with team members or partner						
Understands instructions and is able to begin activity						
Helps teammates or partner						
Can ask for help from teammates or partner.						
Does not need help from the teacher						
Completes the assignment						
# of assigned tasks completed successfully						

APPENDIX I

TEACHER OBSERVATION FORM:

LEFT-BRAIN ASSOCIATED LEARNING ACTIVITIES

Teacher Observation Form

Date: _____ Observer: _____

Start Time: _____ Finish Time: _____

Rating Scale: 1 = Inadequate, 2 = Poor, 3 = Good, 4 = Excellent, NA = Not Applicable

Left-brain learning activity: Individual life skills reading activity/ Word Scramble

Learner	1.	2.	3.	Comments Learner #1	Comments Learner #2	Comments Learner #3
Stays on task						
Shows interest in reading activity						
Shows interest in spelling activity						
Does not become frustrated or stop trying if activity is difficult						
Can work independently						
Understands instructions and is able to begin activity						
Does not need help from classmates						
Does not need help from the teacher						
Completes the assignment						
# of assigned tasks completed successfully						

APPENDIX J

OBSERVATION RESULTS:

RIGHT-BRAIN ASSOCIATED LEARNING ACTIVITY #1

Observation Results for Right-Brain Learning Activity #1: Clothing Identification, 5/15/12

Learner	PS	NM	ES	PP	DD	PIP	LW	MC	HH	ELP	PW	TN	KP	TK	Average	%
Stays on Task	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Shows interest in group activity	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Does not become frustrated or stop trying if activity is difficult.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Interacts with team members	4	4	4	4	3	4	4	4	4	3	4	4	4	4	3.8	96
Understands instructions and can begin activity	4	4	4	4	4	3	4	4	4	4	4	4	4	4	3.9	98
Offers help to teammates	4	4	3	4	4	3	4	4	4	4	4	4	4	2	3.7	95
Asks teammates for help.	4	4	3	4	4	4	4	4	2	4	4	4	4	4	3.7	95
Does not need help from teacher	3	3	4	3	4	3	4	4	3	3	4	4	4	2	3.4	86
Completes assignment	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
# of assigned tasks successfully completed (10)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100

Rating Scale 1 = Inadequate, 2 = Poor, 3 = Good, 4 = Excellent

Notes: 6 students take leadership or organizational roles in their groups.

This is the first learning activity in the group of 4 activities.

** No interpreter for this activity.

Learner groups independently add color to the clothing identification.

Time: 9:15 - 10:20 a.m.

APPENDIX K

OBSERVATION RESULTS:

RIGHT-BRAIN ASSOCIATED LEARNING ACTIVITY #2

Right-Brain Associated Learning Activity #2: Role Play, 5/24/12

Learner	PS	NM	ES	PP	DD	PIP	LW	MC	HH	ELP	PW	TN	KP	TK	Average	%
Stays on Task	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Shows interest in partner activity	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Does not become frustrated or stop trying if activity is difficult.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Performs assigned role	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Interacts with partner	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Does not need help from partner	4	4	3	4	4	4	4	4	4	4	2	4	3	2	3.6	90
Understands instructions and can begin activity	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Does not need help from teacher	4	4	4	4	4	4	4	4	4	4	2	4	3	2	3.6	90
Completes assignment	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
# of assigned tasks successfully completed (10)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100

Rating scale: 1 = Inadequate, 2 = Poor, 3 = Good, 4 = Excellent

Notes: Four students need help with color ID.
All students excellent at assigned roles.
Two lower level students need a lot of teacher help.

Time: 9:30 - 10:10 a.m.

APPENDIX L

OBSERVATION RESULTS:

LEFT-BRAIN ASSOCIATED LEARNING ACTIVITY #1

Observation Results: Left-Brain Associated Learning Activity #1: Word Scramble, 5/21/12

Learner	PS	NM	ES	PP	DD	PIP	LW	MC	HH	ELP	PW	TN	KP	TK	Average	%
Stays on Task	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Shows interest in spelling activity	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	100
Does not become frustrated of stop trying if activity is difficult	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Can work independently	4	3	4	3	4	4	3	4	4	4	4	4	4	2	3.6	90
Understands instructions and can begin activity	4	4	4	4	4	4	3	4	4	4	4	4	3	3	3.8	95
Does not need help from classmates	4	3	4	3	4	3	4	4	4	4	4	4	4	2	3.6	90
Does not need help from teacher	4	4	4	4	4	4	3	4	4	4	4	4	3	2	3.7	92
Completes assignment	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
# of assigned tasks successfully completed (12)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	100

Notes:

ELP is tired today.

KP not crossing off words; teacher helps.

PP not crossing off words; teacher helps.

PP getting help from DD.

TN finishes before the others.

PW - not crossing off word, teacher helps.

TK needs a lot of help to complete the assignment

Time: 9:50 - 10:03 A.M.

Rating Scale: 1 = Inadequate, 2 = Poor, 3 = Good, 4 = Excellent

APPENDIX M

OBSERVATION RESULTS:

LEFT-BRAIN ASSOCIATED LEARNING ACTIVITY #2

Left-Brain Associated Learning Activity #2: Life Skills Reading, 5/23/12

Learner	PS	NM	ES	PP	DD	PIP	LAW	MC	HH	ELP	PPW	TN	KP	TK	Average	%
Stays on Task	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Shows interest in reading activity	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Does not become frustrated of stop trying if activity is difficult	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
Can work independently	4	3	4	4	4	4	4	4	3	4	2	4	3	2	3.5	87
Understands instructions and can begin activity	4	4	4	4	4	4	4	4	4	4	3	4	4	3	3.8	96
Does not need help from classmates	4	4	3	4	4	4	4	4	4	4	4	4	3	4	3.8	96
Does not need help from teacher	4	4	4	4	4	4	4	4	3	4	2	4	3	2	3.6	89
Completes assignment	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100
# of assigned tasks successfully completed (4)	4	4	4	4	4	4	4	4	4	4	4	4		4	4	100

Rating Scale 1 = Inadequate, 2 = Poor, 3 = good, 4 = Excellent

Notes:

1. Generally, students helping each other - Some direct copying, but not noted above.
2. TK, PPW need a lot of teacher help
3. Students seem generally interested in completing and understanding the assignment
4. Room fairly quiet and organized. No ss movement, quiet conversation.

REFERENCES

Alferink, L. A., & Farmer-Dougan, V. (2010). Brain-(not) based education: Dangers of misunderstanding and misapplication of neuroscience research. *Exceptionality, 18*(1), 42-52. doi:10.1080/09362830903462573

Barron, S., Lkell, J., Yin, S.M., VanBik, K., Swain, A., Larkin, E., Allot, A.J. & Ewers,K.(2007). Refugees from Burma: Their backgrounds and refugee experiences.*Culture Profile, 21*. Retrieved from http://www.culturalorientation.net.

Bitterlin, G., Johnson, D., Price, D., Ramirez, S., (2008). *Ventures Basic Student Book*. New York: Cambridge University Press.

Caine, R. & Caine G. (1994). *Making connections: Teaching and the human brain.* New York: Addison-Wesley Publishing.

Canale, M. & Swain, M. (1980). Theoretical bases for communicative approaches to second language teaching and testing. *Applied Linguistics , 1* (1), 2-45.

Canale, M. & Swain, M. (1981). A theoretical framework for communicative competence.

Connell, J.D. (2005*). Brain-based strategies to reach every learner: Surveys, questionnaires, and checklists that help you identify students' strengths – plus engaging brain-based lessons and activities.* New York: Scholastic Inc.

Danesi, M. (1994). The Neuroscientific perspective in second language acquisition research: A critical synopsis. *IRAL: International Review of Applied Linguistics in Language Teaching, 32*(3), 201-219.

Danesi, M. (2003). *Second language teaching: A view from the right side of the brain.* Dordrecht, The Netherlands: Kluwer Academic Publishers.

Danesi, M. & Mollica, A. (1988). From right to left: A "bimodal" perspective of language teaching. *The Canadian Modern Language Review/La Revue Canadienne desLangue Vivantes,45*(1), 76-90.

Dornyei, Z. (2007*). Research methods in applied linguistics: Quantitative, qualitative, and mixed methodologies*. New York: Oxford University Press.

Farmer, L. (2004). Left brain. Right brain. Whole brain. *School Library Media Activities Monthly,21*(2), 27-28.

Freeman, D. (1998). *Doing teacher research: From inquiry to understanding.* Pacific Grove, CA: Heinle & Heinle.

Gardner, H. (2004). *Frames of the mind.* New York: BasicBooks.

Genesee, F. (2000). Brain research: Implications for second language learning. Retrieved from Center fro Research on Education, Diversity and Excellence, UC Berkley permalink: http://escholarship.org/uc/item/58n560k4.

Gülpinar, M. A. (2005). The principles of brain-based learning and constructivist models in education. *Educational Sciences: Theory & Practice,5*(2), 299-306.

Jones, N.B. (1998*). Action research, learning styles, and EFL/ESL writing.*(ERIC Document Reproduction Service No. ED 439 606)

Kim-Rivera, E. (1998). Neurolinguistic applications to SLA classroom instruction: A review of the issues with a focus on Danesi's bimodality. *Texas Papers in Foreign Language Education,3*(2), 91-103.

Lee, L-T. & Hung, J.C.(2009). Effects of teaching using whole brain instruction on accounting learning. *International Journal of Distance Education Technologies, 7*(3), 63-84.

Lombardi, J. (2008). Beyond learning styles: Brain-based research and English language learners. *The Clearing House, 81*(5), 219-222.

Luvaas-Briggs, L. (1984). Some "whole brain" activities for the community college reading class. *Journal of Reading, 27*(7), 644-647.

Karen Teacher Working Group. (2011). Retrieved October 12, 2011 from http://ktwg.org/

Madrazo,G. & Motz, L. (2005). Brain research: Implications to diverse learners. *Science Educator,14*(1), 56-60.

McKay, S.L. (2008). *Researching second language classrooms.* New York: Routledge.

Info Mekong. (2010-2011). *Sgaw Karen Profile*. Retrieved August 4, 2010, from http://www.infomekong.com/karen.htm

McCarthy, B. (1990). Using the 4MAT system to bring learning styles to schools. *Educational Leadership, 48*(2), 31-36.

Merriam, S.B. (2009). *Qualitative research: A guide to design and implementation.* San Francisco: Josey-Bass.

Morse, M. (2004). Enhancing the learning and retention of biblical languages for adult students. *Teaching Theology & Religion, 7*(1), 45-50. doi: 10.1111/j.1467-9647.2004.00190.x

Nakashima, D. & Vaddhanaphuti, C. (2006). An education rooted in two worlds: the Karen of northern Thailand. *International Social Science Journal, 58*(187) doi: 10.1111/j.1468-2451.2006.00608.x

O'Malley, J.M. & Valdez Pierce, L.V. (1996). *Authentic assessment for English language learners: Practical approaches for teachers.* Reading, MA: Addison Wesley Publishing.

Ornstein, R. (1997). *The right mind: Making sense of the hemispheres.* New York: Harcourt Brace & Company.

Peoples of the World Foundation. (2011). *The Karen.* Retrieved June 6, 2011 from http://www.peoplesoftheworld.org/text?people=Karen

Reis, A. (2006). Color makes a difference: Two-dimensional object naming in literate and illiterate subjects. *60*(1), 49-54. doi: 10.1016/j.bandc.2005.09.012

Reis, A., Gueireiro, M. & Castro-Caldas, A. (1994). Influence of educational level of non brain-damaged subjects on visual naming capacities. *Journal of Clinical and Experimental Psychology, 16*(6), 939-942. doi: 10.1080/01688639408402705

Reiterer, S., Pereda, E., &Bhattacharya, J. (2009). Measuring second language proficiency with EEG synchronization: How functional cortical networks and hemispheric involvement differ as a function of proficiency level in second language speakers. *Second Language Research,25*(1) 77-106.

Sousa, D. (2006). *How the brain learns* (3rd ed.). Thousand Oaks, CA: Corwin Press.

Springer, S.P. & Deutsch, G. (1998*). Left-brain, right brain: Perspectives from cognitive neuroscience* (5th ed.). New York: Worth Publishers.

Vinogradov, P. (2008). "Maestra! The letters speak." Adult ESL students learning to read for the first time. *Minnetesol Journal, 25.* http://minnetesol.org/blog1/minnetesol-2008-journal/2008-journal/vinogradov_final/

Williams, L.V. (1983*). Teaching for the two-sided mind: A guide to right brain/left brain education.* New York: Simon & Schuster, Inc.

Wolfe, P. (2010). *Brain matters: Translating research into classroom practice* (2nd ed.). Alexandria, VA: ASCD.

Zadina, J.N. (2008). *Six seeks to a brain-compatible classroom.* USA: R & IN.