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INSTITUTE OF EDUCATIONAL SCIENCES
DEPARTMENT OF ENGLISH LANGUAGE TEACHING

**TEACHING ENGLISH AS A FOREIGN LANGUAGE TO
UNIVERSITY STUDENTS IN A MORE BRAIN
COMPATIBLE CLASSROOM**

745007

M.A. THESIS

By
SERHAN KÖSE

Supervisor
Assist. Prof. Dr. İskender H. SARIGÖZ

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Serhan K¼se'ye ait **“Teaching English as A Foreign Language to University Students in a More Brain Compatible Classroom”** adlı alıřma j¼rimiz tarafından Yabancı Diller Eđitimi Anabilim Dalı İngilizce Öğretmenlięi Programında Y¼KSEK LİSANS tezi olarak Kabul edilmiřtir.

Başkan

.....

Prof. Dr. Güler ÜLKÜ

Üye

.....

Yrd. Do. Dr. İskender H. SARIGÖZ (Danışman)

Üye

.....

Do. Dr. Gülsev PAKKAN

ÖZET

Bu çalışma Üniversite öğrencilerinin klasik sınıflarından farklı olarak beynin fiziksel ve psikolojik olarak daha rahat bir eğitim ortamına uyacağı bir sınıfta İngilizce öğrenmelerinin faydalarını sorgulamayı amaç edinmektedir.

Dört bölümden oluşan çalışmanın birinci bölümü çalışmanın kuramsal çerçevesini sunmaktadır. Aynı zamanda çalışmanın amacını, kapsamını ve çalışmada kullanılan veri toplama ve değerlendirme yöntemlerini sunmaktadır.

Çalışmanın ikinci bölümü, konuyla ilgili kaynak ve veri taramasını kapsamaktadır. Genel olarak beynin yapısı ve fonksiyonu üzerinde durmakta ve buna uygun bir sınıf ortamı nasıl oluşturulacağı ve ne tür yöntemler uygulanabileceği belirtilmektedir.

Üçüncü bölüm araştırmanın yöntemini, veri analizini ve tartışmasını kapsamaktadır. Dördüncü bölüm ise sonuç bölümü olup, çalışmanın kısa bir özeti yapılmakta ve öneriler sunulmaktadır.

ABSTRACT

This study aims to determine the benefits of university students learning English in a more compatible classroom where they are psychologically and physically more comfortable than the traditional classroom.

This study comprises of four chapters. and the first chapter offers a background to the study. Also in this chapter the aim and scope of the study, and the methods are given.

In the second chapter the literature review is presented. The structure and function of the brain is given and a classroom and applicable methods to it is briefly given.

Chapter three deals with the research methodology and the data analysis, and presents a discussion of the results. Chapter four is the conclusion section and a brief summary of the study is presented.

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CHAPTER 1

1.0.INTRODUCTION

In this part, first the background to the study is presented. Then, the problem of the study, the aim of the study and the scope and limitations of the study are stated. Finally, the method and hypotheses which have guided the study are presented.

1.1. Background to the Study

There is a truth that there are still some problems arising in teaching a foreign language. For this, various kinds of approaches, ways and methods have been oriented. The aim is to teach English quickly and efficiently. There are many factors that influence learning. Lopez and Alipoon (2001:33) claim that learning is a complex activity affected by many factors: our senses, attention, emotion, experiences, and reflective thinking. So these factors must be taken into consideration when teaching English.

We underrate our brains and our intelligence. Formal education has become such a complicated, self-conscious and overregulated activity that learning is widely regarded as something difficult that the brain would rather not do.... But reluctance to learn cannot be attributed to the brain. Learning is the brain's primary function, its constant concern, and we become restless and frustrated if there is no learning to be done. We are all capable of huge and unsuspected learning accomplishments without effort (Frank Smith, 1986:18).

We accept the truth that every person is unique and that every brain is unique, as well. This means that every brain has its own natural learning process. It has long been known that regions of the brain have specialized functions. For example the

frontal lobes are involved in abstract reasoning and planning, while the posterior lobes are involved in vision. But recent findings indicate that the brain is much more malleable than previously thought. Specialized functions of the specific regions of the brain are not fixed at birth but are shaped by experience and learning. Most of the teachers and the school environment aren't aware of these facts. Even if they are aware they don't organise according to these facts. Funderstanding (1998:1) puts forth that traditional schooling usually doesn't take account the natural process and this often inhibits learning by discouraging, ignoring, or punishing the brain's natural process. And also Stevens and Goldberg (2001:3-4) include that the major belief of the Industrial Age held that the efficient management based on the principles of science and technology was capable of solving any problem. The principles for efficient management were adapted from a militaristic developed in the 1700's. ... Militaristic influences are strongly evident in the organizational pattern of school. Students are separated into groups and placed in grades, from kindergarten all the way through college. One another fact that Caine & Caine (1997) state is that teachers deliver information and students are assessed on how much of the information they have stored.

The aim in constructing a brain compatible classroom is to create learning opportunities which are consistent with natural brain process. It's also aimed to make the students use the full potential of their brain. Wolfe (2001:1) argues that the more we understand the brain, the better we'll be able to design instruction to match how it learns best. And also Lopez and Alipoon (2001:29) add that the knowledge gained from neuroscience must be integrated with current educational, psychosocial, and empirical evidence from classroom experience before planning teaching strategies. According to Sousa (2001:3), recently teachers try to change the human brain every day. The more they know about how it learns, the more successful they can be. In the same sense Lopez and Alipoon (2001:31) state that to make sure concepts are stored and later be retrieved, teachers need to encourage students to analyze and achieve understanding, not just get through the material. The learning must not be ordinary. In creating a brain compatible classroom the teacher must look at teaching developmentally, socioculturally, and in other broadways. Brain compatible learning

and teaching focuses on how the brain learns and how language teachers can learn to understand and use this knowledge to help second language students learn English quickly and efficiently.

1.2. The Problem of the Study

It is said that students who are learning English have problems in learning the language because of the classroom environment and the approaches the teachers use which are not consistent with their natural learning process. The problem is to find the environmental factors which minimize students learning and maintain an environment which is appropriate for the learners' brain and to take the students intelligences, styles, approaches and techniques into consideration and deal with the diversity in students.

This study will focus on the environmental, physical, and the psychological conditions that affect the students' learning.

One other factor is that the left hemisphere is said to deal more with language function and when teaching a foreign language the applications should be to focus on the left hemisphere. Here, the other factor is to apply approaches, strategies and techniques that service not only the right hemisphere of the brain but also the areas that are not been designed to cope with language. Hopefully, the activities done for this purpose will help both the ELT students and teachers to be more effective and sufficient in their classes and shorten the learning process.

1.3. The Aim of the Study

The aim of this study is to create a classroom environment that is not threatening for the students. Another aim is to identify the student's intelligences, styles and the dominance of the hemispheres of their brain. By doing so it is aimed to

make the teacher and the students know their own strengths. After the students' strengths are identified, strategies and techniques that are convenient to the process of learning of the brain in a more compatible class and methods on addressing these features will be applied. Another purpose of this study is to supply different kinds of activities that address to both sides of the hemispheres, intelligences and styles.

1.4. The Scope and Limitations of the Study

In this study, the effects of learning English in a more brain compatible classroom on certain cognitive and affective qualities of the students were examined. This study was done experimentally in the English Course, which the first year students take compulsorily. In the study, students made up the universe of the research, and Gazi University Kastamonu Education Faculty, Primary School Education Department first year students made up the subjects of the research. The sixty students had already been grouped into two; thus, these two were randomly assigned to the experimental group and the control group. The students in the experimental group studied the course book, Headway Elementary in a more brain compatible classroom for six weeks, and the students in the control group studied the same course material in a traditional classroom, again for six weeks.

The variables examined in the research were academic achievement, motivation, the students' developing positive attitudes towards a brain compatible environment. These dependent variables were examined with respect to the brain compatible classroom. Also the variables of the student's intelligences, learning styles and hemisphere dominance of their brain were identified and examined before the study was applied.

1.5. Method

First, pre-test will be applied to identify the levels of the first grade student which are in the Primary School Education Department and then subjects at the same proficiency levels will be selected randomly to compose the control group and the experimental group. The student's intelligences, styles and the dominance of their brain will be identified and shown in graphs and charts. The student's attitude towards learning English in a more compatible classroom and the scale of motivation will also applied and these will be evaluated and interpreted by statistical methods and will also be presented in graphs and charts. Then, the experimental group will be administered English in a more brain compatible classroom which will be composed earlier. The control group will be introduced to English in a traditional university classroom. After six weeks of practice a post-test will be applied to identify the process in both of the groups. The results of the proficiency pre-test and post-test will be evaluated and interpreted by using statistical methods. The findings will be presented in charts and graphs. The results of the subject and control group will also be compared and the proficiency difference will also be presented in charts and graphs.

1.6. The Hypotheses of the Study

In creating a more brain compatible classroom and learning atmosphere the learner's intelligences, styles and their brain dominances were identified, and after. the hypotheses related to these three variables in the research are the following: A significant difference is expected in favour of the experimental group as regards the post-test scores 1- in the academic achievement test, 2- in the scale of motivation, 3- in the scale of developing positive attitudes towards a brain compatible environment.

CHAPTER 2

REVIEW OF LITERATURE

2.0.Introduction

In order to understand the basis of creating a brain compatible language classroom first of all we have to realize the different parts of the brain and its functions on dominance. Also, the studies on the identification of the specialized intellectual functions of each hemisphere must be made cautiously. The aim is not trying to become an expert on the anatomy of the brain but teachers must try to understand the multifunction of the brain and order the teaching task according to the complexities of the brain, because the brain's primary function is to learn. Sousa (2001:3) states that teachers try to change the human brain every day. The more they know about how it learns, the more successful they can be. Knowledge is power.

Teaching English has become one of the most important educational skills in our country and in the world. So there has been a great effort trying to teach English to students from primary school to university graduate and even in post-graduate programs. But still there is a big problem not just in teaching English but also in other lessons because the education level of the courses given for a long time has been insufficient according to all the aspects that are expected from these courses and schools. The most important factor is the educational environment and the teaching methods of the teachers, because they do not focus on the intelligences. Styles of the students and the learning environment aren't appropriate for learning. To overcome these problems the environment should be prepared to be more brain compatible as well as methods employed.

In this chapter first it is dealt with the basic structure of the brain, its functions and the recent developments on brain. Then, how the brain is specialized. the needs of the brain, the importance and varieties of memory are defined. In the next part creating a brain compatible classroom is presented. And finally, its impact on language teaching and learning is presented.

2.1. The Nervous Systems

The nervous system in our body is divided to two main parts: the central nervous system and the peripheral nervous system. In this part of the study these nervous systems are presented.

2.1.1. The Central Nervous System

The central nervous system consists of the spinal cord and the brain. The brain can be said to be the most important organ in the brain because it is the receiving centre of the sent impulses from the organs in the body and the centre that sends impulses to the body. These impulses make voluntary, involuntary, or autonomic actions in the body according to various reasons.

2.1.1.1. The Brain

Stevens and Goldberg (2001:21) state that understanding the geography of the brain and how each part functions allows us to think about the importance of emotions and all our senses.

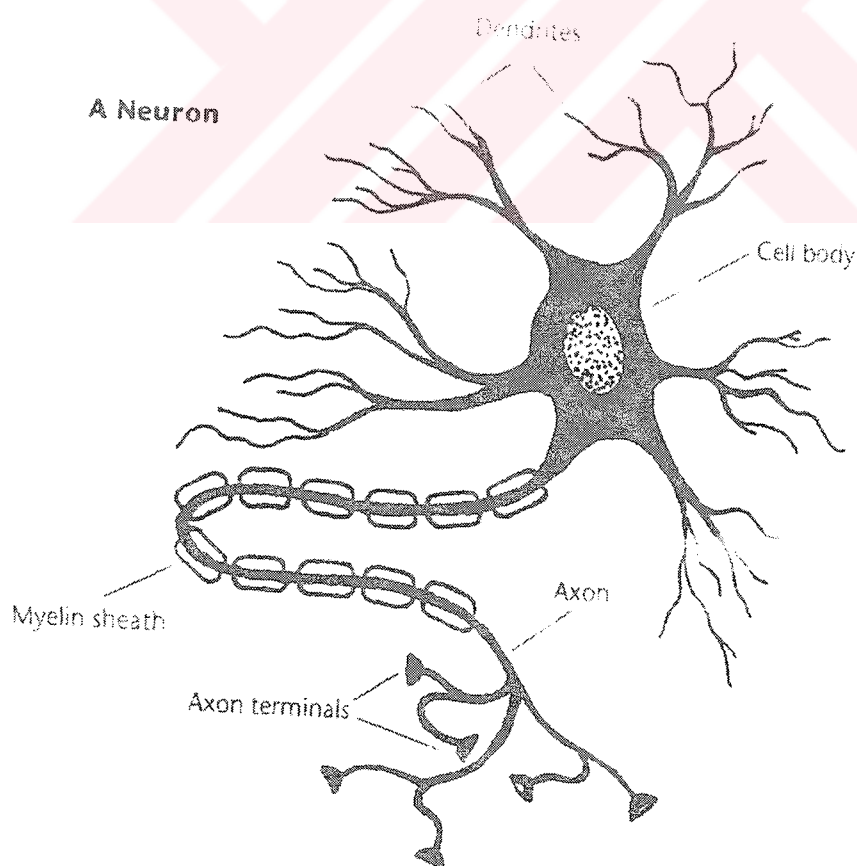
In this section of the study the brain cells, the brain stem, which consists of the mid-brain; thalamus, hypothalamus, amygdala, and hippocampus will be presented. Then the cerebellum, cerebrum and the lobes of the cerebral cortex and

the specialization of the brain are presented. Finally the function of the brain where the physical and psychological needs of the brain are given and the memory is presented as the last section.

2.1.1.1.1. Brain Cells

Jensen (1998:10) states that the majority of brain cells (90 percent) are glial cells, it is the remaining 10 percent – the neurons- that make the brain the thinking and learning organ. Sousa (2001:20) defines the main task of the glial cells as the cells which hold the neurons together and act as filters to keep harmful substances out of the neurons. There are about 100 billion neurons.

Figure 2.1. Neuron

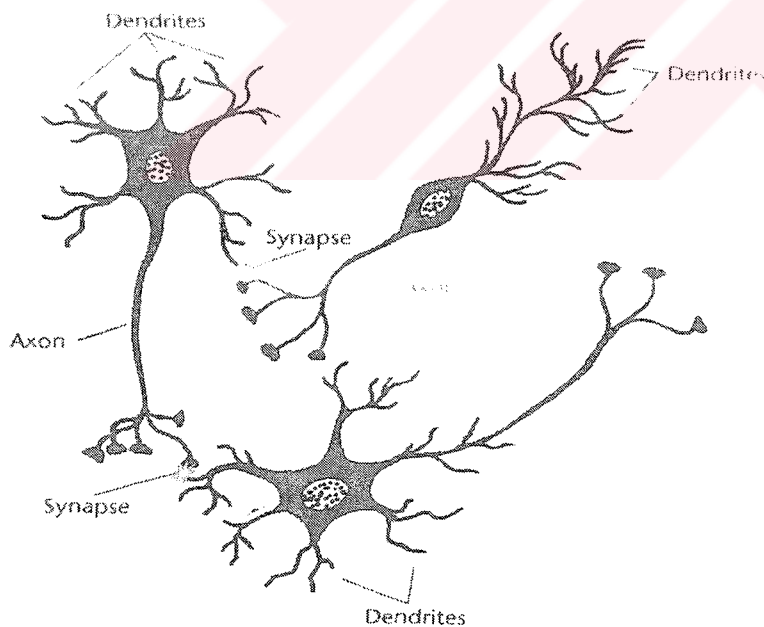


(Stevens, 2001:23)

As it can be seen in figure 2.1, neurons consist of a cell body, dendrites, and axons. They are responsible for information processing and converting chemical and electrical signals back and forth (Jensen, 1998:11).

“Neurons come in different shapes. Some are shaped like a pyramid, and others look like a giant sea fan. Regardless of their shape, most neurons are composed of a cell body, or *soma*, which contains nucleus, thousands of short projections called dendrites (from the Greek word for tree, *dendra*), and a single axon, which is usually covered by a fatty substance called myelin. Dendrites receive information from other cells. The main job of the axon is to send information to other cells. The end of the axon splits into branches, each of which ends in an axon terminal or bulb. Neurons communicate electrochemically by passing messages at the junction (known as the synapse) between axon terminals and spines on dendrites or cell bodies.” (Wolfe, 2001:15-16)

Figure 2.2. Synaptic connections



(Stevens, 2001:25)

We have long believed that neurons were not like other cells and if they were to be destroyed they do not regenerate themselves. But according to the new research

at Salk Institute in La Jolla, California. Kempermann, Kunh and Gage (1997) (quoted by Jensen, 1998:11) reveal that some areas of the brain can and do grow new neurons. Still after some other studies Gould, Reeves, Graziano, & Gross; Kempermann & Gage (quoted by Wolfe:2001:14) claim that these studies have shown that the adult brain does generate new neurons, although the process by which this happens and how these new cells function is not yet fully understood.

What is important is that not the number of the neurons but the organization between them and how they are connected with others which results as learning. As Fogarty (2002:25) states millions of neurons connect to each other in billions of combinations, forming trillions of pathways for nerve signals to follow. What results is referred to as a dendritic growth, and the dendrites continue to grow and interconnect throughout a lifetime. These brain connections, or neural pathways, are wired and rewired constantly, continually, and incessantly as stimuli are produced by the brain.

There are perhaps about one hundred billion neurons, or nerve cells, in the brain, and in a single human brain the number of possible interconnections between these cells is greater than the number of atoms in the universe (Ornstein and Thompson, 1984:21)

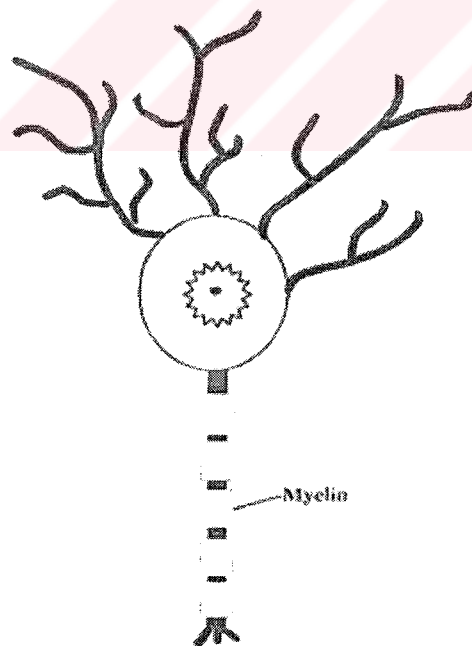
Just as stimulation fosters the growth of dendrites, the lack of stimuli causes the existing connection to weaken and even to disappear (Fogarty, 2002:25). To increase the number of the connections of the dendrites of the students is to provide them challenging experiences through enriched education and environment. Also Stevens and Golberg (2001:24) stress this fact as when students are provided with an enriched environment, the neurons in their brains grow more rapidly and make more connections to other neurons.

2.1.1.1.1. Myelination

The layer called myelin sheath surrounds each axon. The longest axons (running down the spinal cord) may be up to a meter long, but most are closer to a centimetre (Jensen, 1998:12). The sheath insulates the axon from the other cells and increases the speed of impulse transmission. This impulse travels along the neurons through an electrochemical process (Sousa, 2001:20).

The thicker this myelin sheath is the faster it conducts electricity and information. In other words myelin is a fatty substance that forms around well-used axons, and all of the larger axons are myelinated. This seems not only to speed up the electrical transmission (up to 12-fold), but also reduces interference from other nearby reactions (Jensen, 1998:12).

Figure 2.3. Myelinated Neuron



(Sprenger, 2002:23)

In describing myelination Chudler (quoted by Sprenger, 2002:22) says that the myelin coating does not cover the axon like a tube (as seen in figure 2.3.). It looks more like link sausage on the axon. This is because messages travel within the neuron is electrical and the impulse travels on the outside of the axon in a process called *saltatory conduction*. The message travels down the axon aided by the white myelin coat.

2.1.1.1.1.2. Plasticity

The brain has the capability to change according to circumstances. And for this it is said to be plastic. Even if there is damage in the individual's brain, with therapy the brain will not lose its function. Sprenger (2002:24) indicates that the younger the individual, the easier it is for the brain to make these changes. It is still possible for neurons to take on new responsibility later in life.

We have now evidence to illustrate the details of the anatomical changes that do occur with modification in the environment. This evidence addresses many of the questions that concerned the early sociologists and educators, including the effect of the environment on the young as well as the elderly, sex differences, and effects of nutritional deprivation, isolation, or crowding. It is now clear that the brain is far from immutable (Dimond, 1988:2).

If we are to carry this into education it is possible for the students to make them learn by making the parts of their brain function. It is now proven that not only certain parts of the brain function for certain tasks but also parts that are not involved in the task function. For this the teacher has to create a challenging and enriched environment and apply activities which try to activate the parts of their brain which have not functioned before for language learning.

2.1.1.1.1.3. Chemical Messengers

Behavioural, microscopic, molecular or whatever happens in the brain every action is supported by chemical messengers. According to Wolfe (2001:57) even thoughts and emotions are the result of chemical process in the brain. They are called neurotransmitters. Sprenger indicates (2002:24) that about 60 to 100 neurotransmitters have been identified.

“When an action potentially reaches the terminal of an axon, it stimulates the opening of some of the vesicles and thus triggers the release of one or more neurotransmitters into the synaptic cleft. The neurotransmitter molecules diffuse across the cleft. The more action potentials arrive at the terminal, the more molecules are released to the gap. The electrical signal of the action potential has now been converted into a chemical signal, and the synaptic cleft is crossed within thousandths of a second. (At one point scientists believed that each neuron produced only one neurotransmitter. We now know that a neuron may release two or more transmitters at a single synapse; it may even switch transmitters)” (Wolfe, 2001:55)

For a neuron to generate an action the cell should generate an electrical impulse. The neurotransmitters determine if there is sufficient amount of voltage to generate an action potential. All transmitters are (1) amino acids, (2) derived from amino acids (amines), or (3) constructed of amino acids (peptides) which amino acids are the building blocks of proteins and are essential to life Each neurotransmitter has a different shape and the receptors are specifically designed for the shape of the neurotransmitter they are receiving, as precisely as a key is made for a lock (Wolfe, 2001:55-57).

The major neurotransmitters are Acetylcholine (ACh), Serotonin, Dopamine, Norepinephrine, Gamma amino butyric acid (GABA), Glutamate, and Endorphins.

About the importance and function of the transmitters Sprenger (2002:27) clarifies that the combinations and perfect balance of these chemicals affect and are affected by every thought, every word, and every action.

If the psychological and physical needs of the learners have been met and the environment and the activities are stated according to the learner's intelligences and styles, the learning process will be shortened.

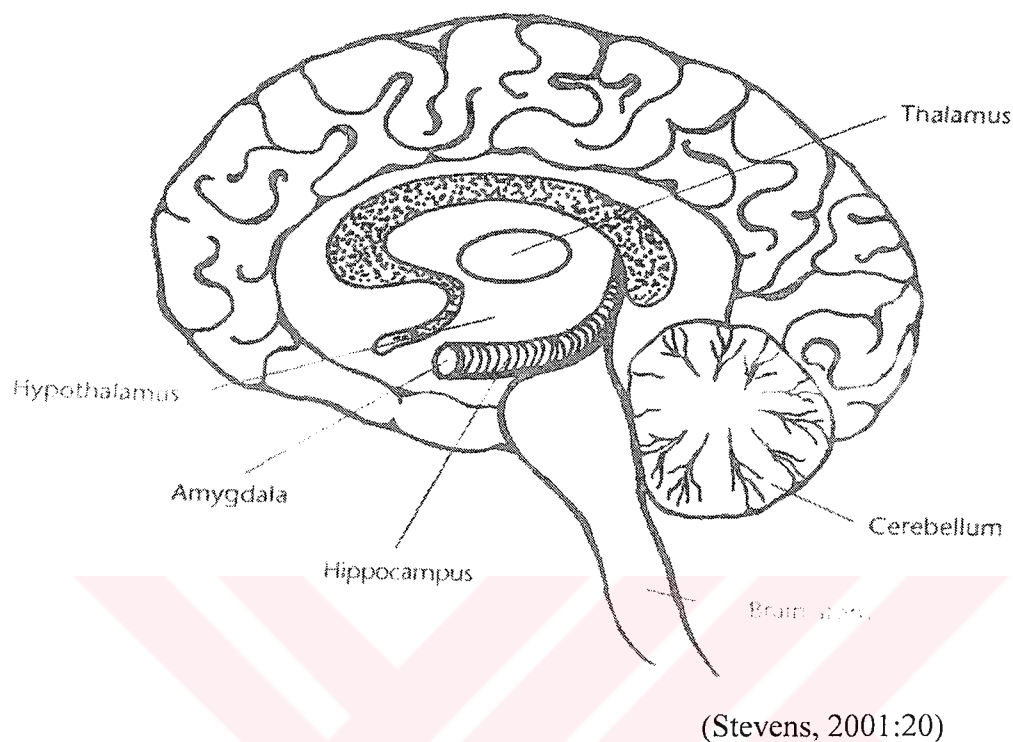
2.1.1.1.2. Brain Stem

The spinal cord starts from the brain stem which is located in the base of the brain. Wolfe (2001:21) defines that the brain stem is divided into three main parts: the midbrain (upper end), the pons (centre area), and the medulla oblongata (lower end). The primary function of the brain stem is survival which is the unconscious working of our body as breathing, heartbeat, blood pressure and etc. The brain stem also controls the production of the chemical messengers which we have mentioned earlier.

2.1.1.1.2.1. Mid-Brain

The mid-brain consists of the thalamus, hypothalamus, amygdala and the hippocampus. They will be defined in this section of the study.

Figure 2.4. Mid-Brain



2.1.1.1.2.1.1. Thalamus and Hypothalamus

The thalamus and hypothalamus regulate perception and the body's vital functions. The thalamus is in the centre of the brain and as Wolfe (2001:24) states this brain structure is in a strategic position to act as a relay station to direct the flow of information between the sense organs and the cortex. Nearly all input from the sensory organs travel first to nerve cell bodies in the thalamus, where the signals are sorted and sent to the receiving areas on the cortex. The hypothalamus is below the thalamus. It is a critical part of the autonomic system and along with the pituitary gland, it controls functions necessary for homeostasis, maintaining the normal state of the body.

Greenfield (1998:163) states that the thalamus besides having a function in processing of hearing and vision it also has a specific area which contributes to memory.

Basically the thalamus and the hypothalamus relays sensory messages to the cerebral cortex, includes all sensory messages except those from olfactory bulb. involved in emotions and drives vital to survival including fear, hunger, thirst, and reproduction, also regulates autonomic nervous system. The pituitary gland is a small endocrine gland which releases hormones and regulates other endocrine glands.

2.1.1.1.2.1.2. Amygdala

The amygdale is located near the thalamus and the hypothalamus. The amygdale can be said to be the psychological sentinel of the brain, because it controls the emotions. Wolfe (2001:27) says that the amygdala are designed for different roles. All the incoming sensory data, except smell, travel first to the thalamus. The thalamus sends the information to the amygdala for evaluation. If the amygdala determines that the stimuli are potentially harmful, it triggers the hypothalamus, which in turn sends hormonal messages to the body to create physical change if necessary.

The amygdala is responsible for arousal and regulation of emotion and the initial emotional response to sensory information plays important role in mediating anxiety and depression.

2.1.1.1.2.1.3. Hippocampus

The hippocampus holds immediate past memories. It also dispatches the memory to the cortex which is accepted as long-term memory. Doux (quoted by Wolfe 2001: 21-28) states that the hippocampus appears to be crucial for you to be

able to remember events in your immediate past, maybe even for few years. Gradually over years, the hippocampus relinquishes its control over the memory to the cortex, where the memory appears to remain, perhaps for a lifetime, in long-term memory.

Hippocampal function tend to emphasize an important role in the formation of cognitive maps and/or the encoding of recent experiences in short-term memory and their possible transfer to more permanent storage in other cortical regions (Squire, 1992:217).

Basically the hippocampus is responsible for the storage of new information in memory. It also compares information with what the brain has come to expect about the world. It is accepted as the “Gateway to memory” because it enables us to navigate through the environment.

2.1.1.1.2.2. Pons

It's located near the top of the brain stem, above the medulla. It's a critical relay station for our sensory information (Jensen, 1998:118).

2.1.1.1.2.3. Medulla Oblongata

The medulla oblongata contains many of the neuronal groups concerned with controlling the autonomic nerve system, those functions normally considered “unconscious”... It also contains the motor neurons of some cranial nerves and major fibre tracts connecting many parts of the brain with the spinal chord (Squire, 1992:194).

It is located in the brain stem. It channels information between the cerebral hemispheres and the spinal cord. It controls respiration, circulation, wakefulness, breathing, and heart rate (Jensen, 1998:117).

2.1.1.1.3. Cerebellum

The cerebellum is at the back of the brain. Wolfe (2001:23) defines the task of the cerebellum as the key to balance, maintenance of body posture, and coordination of muscle function. Because humans have an almost unlimited repertoire of movement, the cerebellum is large, accounting for 11 percent of the brain's weight.

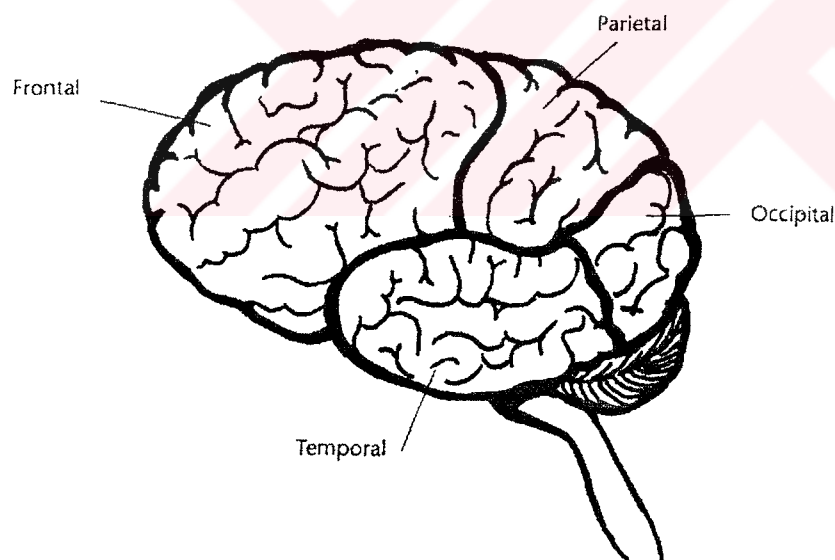
“Coordinated movements, such as walking, lifting a glass, or writing a word, are activities that we often take for granted. The acquisition of the skilled movements involved in these activities begins under the control of the cortex. Though the cortex can plan and initiate movements, it does not have the neural circuitry needed to calculate the sequences of muscular contractions necessary for the movements. That task falls to the cerebellum. When the cerebellum receives information (in about 1/50th of a second) that the motor cortex has begun to initiate a movement, it computes the contribution that various muscles will have to make to perform that movement and sends the appropriate messages to those muscles. The action has begun.... With proficiency the cerebellum takes over much of the control leaving the conscious mind free to do and think about other things.” (Wolfe, 2001:24-25).

Basically it can be said that the cerebellum regulates movements and balance. it is involved in remembering simple skills and acquiring reflexes, plays a part in analyzing sensory information, solving problems and understanding words.

2.1.1.1.4. The Cerebrum and Lobes of the Cerebral Cortex

In the previous part the unconscious functioning parts of the brain have been examined. In this part we will now examine the structures as being aware, recognizing and talking about our feelings and thoughts which are the structures operating at the conscious level. The cerebrum is the largest brain structure. It consists of upper part of brain and divided into two cerebral hemispheres which are connected by the corpus callosum. The cerebral cortex consists of four main lobes. Squire (1992:214) defines as just behind the forehead and above the eyes is the frontal lobe, and at the back of the head is the occipital lobe. Between them are the parietal lobe, near the top of the head, and the temporal lobe, along the sides of the head.

Figure 2.5. Lobes of the Brain



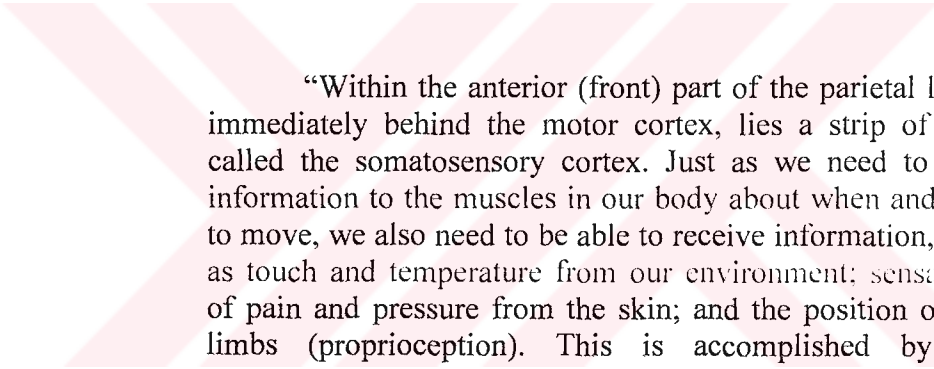
(Stevens, 2001:19)

2.1.1.1.4.1. Occipital Lobes

The occipital lobes are at the lower central back of the brain and they are the primary brain centres for processing visual stimuli because the visual cortex is placed in this lobe. It also identifies if you have seen the stimuli before or not.

2.1.1.1.4.2. Parietal Lobes

The parietal lobes are at the top of both hemispheres of the brain. The parietal lobes have two parts which one of is the anterior and the other posterior part. They have different roles:



“Within the anterior (front) part of the parietal lobes, immediately behind the motor cortex, lies a strip of cells called the somatosensory cortex. Just as we need to send information to the muscles in our body about when and how to move, we also need to be able to receive information, such as touch and temperature from our environment; sensations of pain and pressure from the skin; and the position of our limbs (proprioception). This is accomplished by the somatosensory cortex, the primary region responsible for receiving incoming sensory stimuli. Each part of the body is represented by a specific area on the surface of the somatosensory cortex. The more sensitive a part of a body, the greater the area needed to interpret its messages.... The posterior (rear) part of the parietal lobes continuously analyzes and integrates all this information to give you a sense of spatial awareness. The brain must know at all times where each part of the body is located and its relation to its surroundings.” (Wolfe, 2001:36-37)

The parietal lobes also have the role of spatial attention. If there is a problem on some part of the body the parietal lobe’s attention focuses on that part and when the problem stops its attention stops, as well.

2.1.1.1.4.3. Temporal Lobes

The temporal lobes are above the ear level just in front of the occipital lobes. Their main function is to process auditory stimuli. They are responsible of some hearing, language and some aspects of memory, especially auditory memory, perception, emotional functions. Also in the left lobe there is the Wernicke's area where the words are assembled and then are translated to proper sounds in the Broca's area which is in the frontal lobes. Fogarty (2002:17) states that the temporal lobe receives auditory signals and identifies sounds by comparing them with sound patterns in the memory banks.

2.1.1.1.4.4. Frontal Lobes

The frontal lobes are the largest parts in the brain. Fogarty (2002:17) states that the frontal lobe is located in the neocortex or cerebrum. This region is future-oriented and thinks creatively and analytically in a problem solving mode. It also takes part in the complex behaviours called personality.

The frontal lobes control the body actions for will, thinking about the past, future planning, focusing your attention, reflection, making decisions, solving problems, and engaging in conversation. It is the part that makes us be aware of the things we do and the outside world. Wolfe (2001:39) states that the frontal lobes of the cerebral cortex allow us to be consciously aware of all these actions. It has two main functions; sensorimotor processing and cognition.

At the back of the frontal lobes there is the motor cortex. This cortex controls all the neural activities directing the muscular movements. Every muscle in our body has a corresponding part in the cortex. Ackerman (2001:40) says that in front of the motor cortex there is a part known as Broca's Area and is in the left hemisphere. It has a connection to Wernicke's Area which is in the temporal lobes. The words are assembled in Wernicke's Area and then are translated to proper sounds in the Broca's

area. Then it is passed to the motor cortex for vocal production. Just for a simple sentence these three parts must work together, as all the parts in the brain.

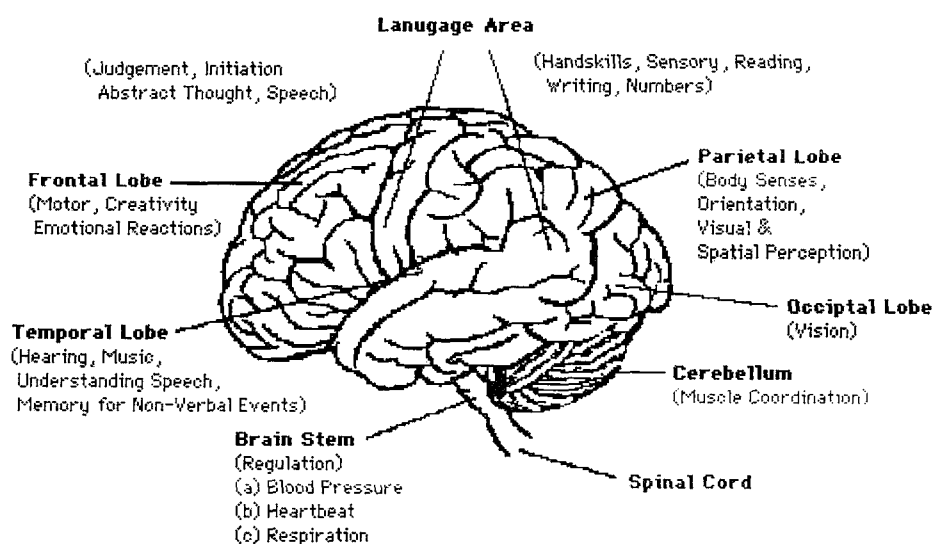
2.1.1.1.5. Brain Specialization

It is known that the brain is divided into two parts which one is on the right and the other on the left. They are connected in the middle. These two hemispheres function asymmetrically, which means that the left hemisphere controls the movements of the right side of the body, and the right hemisphere controls the movements of the left side (Donald, 1991:342).

Also Sprenger (1999:41) includes that the hemispheres may look identical, but they are dissimilar in both size and function.

For a long time there was the idea of a single area of the brain related to a single behavioural ability, such as vision or speech abilities. This was accepted as localization.

Figure 2.6. Localization of the Brain



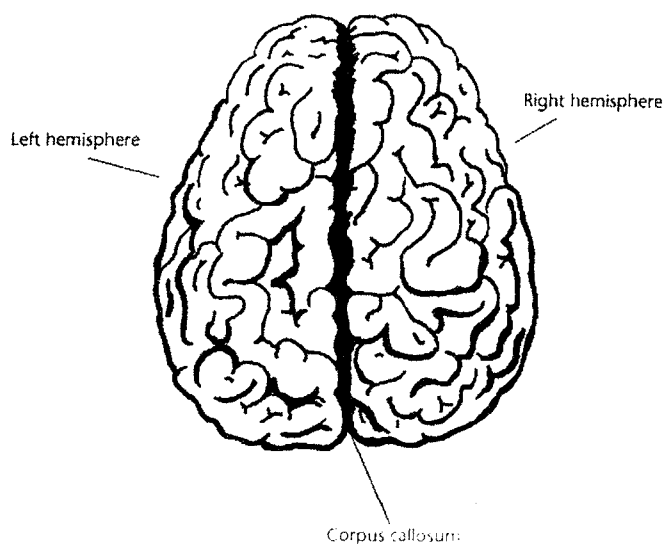
However, it is criticized that there are other areas of the brain involved in language processing and several kinds of evidence were found against the localization theory. Jensen (1996:17) states that the prevailing research in neuroscience avoids the definitive left-right brain labels. They now use the term “relative lateralization”.

“The energy in our brain moves up and down on a vertical axis, from the brain stem to the cortex and back down again. Our brain is designed to process spatially, from small particles to large spatial relationships from left to right hemisphere. It gets even more interesting. We process time in our brains, from the back to the front, from our past to the future. And the mass, the movement of particles, is throughout – with blood flow and neurochemical reaction. Our brain is, in fact, a micro-universe.” (Jensen, 1996:13)

2.1.1.1.5.1. Hemisphericity

The hemispheres are joined by a thick bundle of nerve fibres called corpus callosum, which allows the transmission of information from one hemisphere to the other.

Figure 2.7. Hemispheres of the Brain



(Stevens, 2001: 18)

On the other hand, each hemisphere is thus said to be the dominant one for certain mental functions. The development of these functions within one or other hemisphere is known as lateralization (Crystal, 1987:258). Also Jensen (1996: 14) includes that what we can safely say about each hemisphere is that the left side processes “parts” (sequentially) and the right side processes “wholes” (randomly).

Researches done on the corpus callosum and split-brain patients by Roger Sperry, Michael Gazzaniga and Joseph Bogen showed that left and right hemispheres had specialized functions. Ornstein (quoted by Wolfe, 2001:45) also included that even emotions appeared to be lateralized.

With the right hemisphere processing the more negative emotions and the left more positive and optimistic ones.

“Learners may be much more effective if taught how to process negative moods or events which could impact their learning. Make sure that the skills needed for thinking things through and learning optimism are part of the learning. Learning optimism comes from conflict-resolution skills, goal-setting skills, a sense of belonging and acceptance, visioning activities, developing a sense of value and purpose in life, and physical vitality. (Jensen, 1996:16)

In general the left hemisphere seems more associated with linguistic and analytic processing while the right hemisphere is more associated with more perceptual and spatial processing (Anderson, 1995:26).

Chart 2.1. Function of the Brain

LEFT HEMISPHERE FUNCTION		RIGHT HEMISPHERE FUNCTION
Connected to the right side of the body	C O R P U S C A L L O S U M	Connected to the left side of the body
Processes input in a sequential and analytical manner		Processes input more holistically and abstractly
Time-sensitive		Space-sensitive
Generates spoken language		Interprets language through gestures, facial movements, emotions, and body language
Does invariable and arithmetic operations		Does relational and mathematical operations
Specializes in recognizing words and numbers (as words)		Specializes in recognizing faces, places, objects and music
Active in constructing false memories		More truthful in recall
Seeks explanations for why events occur		Puts events in spatial patterns
Better at arousing attention to deal with outside stimuli		Better at internal processing

(Sousa, 2001: 169)

Furthermore Sousa (2001:170-171) includes that most people have a preferred hemisphere. This preference affects their personality, abilities, and learning style. Although each hemisphere has specialized functions, both usually work together when learning.

2.1.1.1.5.1.1. Left Hemisphere Function

As it can be seen in Chart 2.1., the left hemisphere has the logical, sequential, linear, symbolic, reality-based, verbal, temporal and abstract functions. The left brained analyze from parts to whole, sees the symbols and then finds the whole. As Springer and Deutsch (1998:298) state the major business of the left hemisphere is

the logical representation of reality and communication with the external world. Thinking, reading, writing, counting, and worrying about time is also usually attributed to the left hemisphere.

2.1.1.1.5.1.2. Right Hemisphere Function

As it can be seen in Chart 2.1., the right hemisphere has intuitive, random, holistic, concrete, fantasy-oriented, nonverbal, nontemporal, analogical functions. As Springer and Deutsch (1998:298) state the major business of the right hemisphere is said to be understanding patterns and complex relationships that cannot be precisely defined and may not be logical.

The right side of the brain can understand and do many logical things. Drawing, composing and painting may seem like a right hemisphere activity, yet artists show bilateral activity. In planning of artwork, they follow their own logic and rules about shapes, colour and sounds. An artist can express anything on canvas, clay, glass, metal or paper. But to be acceptable to the masses, it needs to follow very specific, certain (though unwritten) rules of proportionality, complimentary colour schemes, balance and order. The right brain, it seems, does prefer its own kind of holistic order (Jensen, 1996:17).

2.1.1.1.6. Brain Function

In this section physical needs which are air, water (hydration), sleep and nutrition of the brain will be presented. In the second part the psychological needs of the brain which are belonging, fun, freedom and power will be presented. And in the last part memory will be presented in its varieties as semantic, episodic, procedural, automatic, and emotional.

2.1.1.1.6.1. Physical needs

In order for the brain to be able to focus on complex tasks basic physical and psychological needs must be satisfied. Kaufeldt (1999:74) says that the first needs we must satisfy are physical. We must find ways to eat and drink to avoid hunger and thirst to ensure survival of our species, we must find ways to reproduce. We must also relieve ourselves.

2.1.1.1.6.1.1. Air

One of the important physical needs that are important for the brain is the air rate in the classroom and the way the learners breathe. Both affect the brain and influence the learners' learning. Oxygen is essential to the brain. Blood flows in the brain and if it is highly oxygenated it will accelerate the learning process by supporting the neurotransmitters to produce and release themselves. Physical activity helps provide oxygen-rich blood needed for higher levels of learning performance. As Fletcher (2000:11) focuses although the brain is roughly two percent of body weight, about a quarter of heart activity is used to keep it supplied with the oxygen it needs to function effectively. Moreover Wolfe (2001:5) includes that the resting brain uses oxygen and glucose at ten times the rate of the rest of the body.

Researches have shown that we tend to breathe more through one nostril for ninety minutes to two hours, and then switch. But something more important was discovered: when breathing through the left nostril, your right brain is dominant and vice versa. It was also revealed that spatial and verbal processing is affected by nostril breathing. It does matter when you are breathing more through the left or right nostril or through both.... Researchers concluded either that unilateral nostril breathing differentially activates hemispheres or that "attempts of the brain to control the nasal cycle unilaterally interfere with performance." Research tells us that this occurs in most learners every 1-3 hours (Jensen, 1994:138).

These cycles are the same, day or night. We are more simply more alert during the daytime cycles. And the learner may want to know best to take advantages of them (Jensen, 1996:42).

The human brain controls most of our movements. The cerebellum stores movement in our brain. The vestibule controls our balance. The brain needs constant new rich blood every second and minute. If we don't get this constant supply of oxygen rich blood our brain will be damaged.

Human activity destroys negative ions which in turn affects the oxygen that we breathe and the functioning of our brain. Many lethargic or underperforming learners may simply be very highly susceptible to the ionization changes in the air. You may want to purchase an environmental ionizer. They can help booster alertness and learning (Jensen, 1996:67).

Fletcher (2001:37) says that the brain is roughly 2 % of body weigh but needs about 20 % of our oxygen intake to function effectively. Movement built into the lesson, some fresh air, the opportunity for –the brainstem or reflex brain at the cerebellum to raise the heart beat and get oxygen to where it`s needed will relieve the stiffness and tension caused by sitting still, and greatly improve concentration level.

2.1.1.1.6.1.2. Water (Hydrenation)

The brain gets energy for learning mainly from the blood. Thirst develops from a drop in the water content in the blood. Thirst creates dehydration and a dehydrated brain is not able to perform at optimal levels. The brain, made up of a greater percentage of water than any other organ in the body, is quickly affected by dehydration. A dehydrated brain is less attentive and more lethargic. Besides that, when the amount of water in blood drops, the level of salt concentration raises. This condition, in turn, increases blood pressure and stress. Heybach and Daniels (1979) determined that the hormones associated with stress are dramatically reduced within

five minutes of drinking water. In 1989 Levine and Coe determined that making water available to learners the increased level of stress hormones is either very reduced or not present.

Consensus suggests that we should all be drinking between 6 and 8 glasses of water a day. Have participants brainstorm ways in which water (soft drinks, tea, juices or coffee don't do the trick) may be made consistently available to students and staff.

2.1.1.1.6.1.3. Nutrition

Nutrition is an important factor in dealing with brain and behaviour. The brain and its neurons are essentially made of fat, but they communicate with each other via proteins that we eat. The hormones and enzymes that cause chemical changes and control all body processes are made of proteins. What you eat affects which nerve chemicals will be dominant in your brain, which affects how you feel. Carbohydrates can make you feel tired, because they increase the brain's level of the amino acid tryptophan, which in turn spurs the brain to make the calming neurotransmitter serotonin. Serotonin is important for normal sleep patterns, learning, blood pressure and appetite, among many other functions.

Eating protein raises the levels of another amino acid called tyrosine, which prompts the brain to manufacture norepinephrine and dopamine, other kinds of chemical messengers in the brain. Not as well known as serotonin, norepinephrine and dopamine can keep you energized by promoting alertness and activity.

Jensen (1994:158) states that many typical learning problems may represent cases of under-nutrition. Too much food or the wrong kinds of food can cause lethargy and drowsiness. Too much time in between eating can cause loss of concentration and decrease alertness. Teachers should make sure learners are given several opportunities to eat nutritious snacks throughout the day.

So in order to motivate the students we should advise them to be careful about their nutrition which is one of the important factors in learning. One another way to solve this problem during the course is to provide some snacks or biscuits for temporary solution.

2.1.1.1.6.1.4. Sleep

Sleep appears to be a passive and restful time when the brain is less active. In fact, this state actually involves a highly active and well-scripted interplay of brain circuits to produce the stages of sleeping. The stages of sleep were discovered in the 1950s in experiments examining the human brain waves or electroencephalogram (EEG) during sleep. Researchers also measured movements of the eyes and the limbs during sleep. They found that over the course of the first hour or so of sleep each night, the brain progresses through a series of stages during which the brain waves progressively slow down. The period of *slow wave sleep* is accompanied by relaxation of the muscles and the eyes. Heart rate, blood pressure and body temperature all fall. If awakened at this time, most people recall only a feeling or image, not an active dream (The Society for Neuroscience 2002:22).

2.1.1.1.6.2. Psychological Needs

There are the psychological needs of the brain to concentrate with full potential in the learning process. These are belonging, having fun, freedom, and power. Now, they will be presented.

2.1.1.1.6.2.1. Belonging

One important factor in the psychological needs of the brain to satisfy the needs of being included in a society, a family, a class, a group, an activity, etc.. As

Kaufeldt (1999:80) states to belong to a group and feel included and cared for is an important need. If your students never have the opportunity to disclose information about themselves, their families, their likes and dislikes, their concerns, then they perhaps feel judged only by their outward appearance or behaviour.

2.1.1.1.6.2.2. Fun

The main aim in teaching is to reveal from monotonous teaching and making things unexpected so it will create fun, curiosity, and make the student experience different roles. Jensen (1996) includes that laughter can lower stress and perhaps even triggers the immune system to help fend off disease. A good laugh also improves memory and attention. Fun and laughter boots production of neurotransmitters needed for alertness and memory. This will be dealt detailed later in the study.

2.1.1.1.6.2.3. Freedom

Freedom is nearly the opposite of belonging and is a basic need of the psychological brain. Kaufeldt (1999:82) states this as although we want to be included in as part of a group, we also want the freedom to choose when, with whom, and for how long. The right to have the choice, to choose is a powerful freedom. If they are forced they will be indifferent, demotivated, or even violent.

2.1.1.1.6.2.4. Power

This need is to have power over our environment, class, classmates, or group. Glasser (quoted by Kaufeldt, 1999:83) suggests that almost all of us are ambitious and worry about “winning”. The list of how we worry about power is endless: our

need to be “right”, to be recognized, to achieve and influence others, to look good, and so on.

It is best to give the students the sense of control of themselves. They will become confident and self-directed.

2.1.1.1.7. Memory

As Squire and Kandel (quoted by Sousa, 2001:78) state the study of memory might also affect pedagogy by suggesting new methods of teaching based upon how the brain stores knowledge. Also Wolfe (2001:115) adds that having seen or experienced things more than once seems to prime our ability to recall it later.

Information enters the brain through the senses. The senses are literally bombarded by sensory information to the tune of millions of bits of information per second. Most of that information is immediately dropped from the system within 5 to 20 seconds. This dropped information is not processed and so not stored anywhere in the brain's memory system. We can only recall or retrieve information from memory which we paid attention to in the first place.

Carter (quoted by Sousa, 2001:275) states that the human memory is different from that of a computer's in that it is selective. Items of interest-those that ultimately have some bearing on survival- are retained better than those that are not. So personal and meaningful memories can be held in their billions while dry facts learnt at school may soon fade away.

Information that makes it to short term memory must be actively processed in some way: discussing, thinking, writing, drawing, etc.. Long term memory is composed of explicit and implicit memories. Retrieval of different types of memories stored in long term memory is specific to the type of memory. Schools need to capitalize on helping students consider all the retrieval systems.

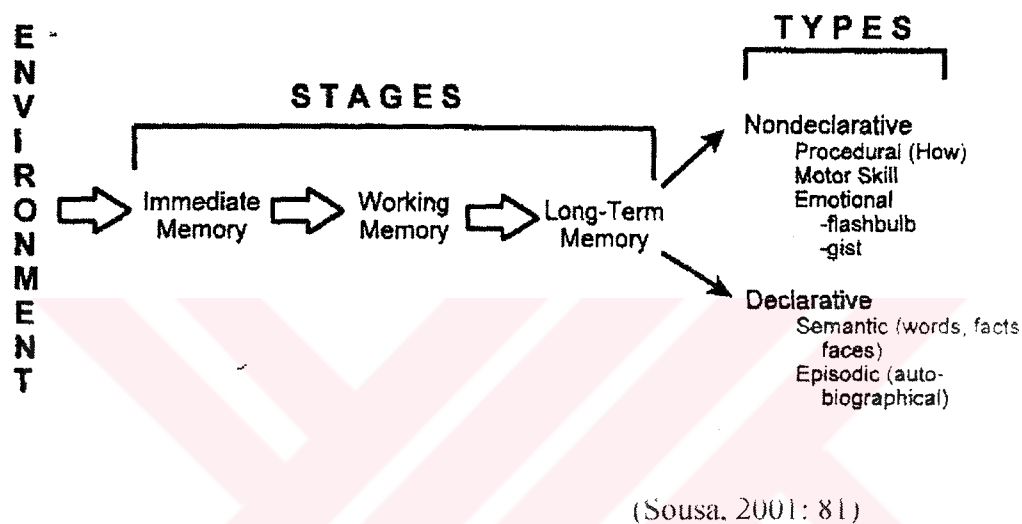
Once sensory memory enters the brain, the limbic system takes over, screening for emotional relevance. Relevant information is sent to short term memory where rehearsal and elaboration send it on to long term memory. Emotionally charged events are more easily recalled than mundane information.

The more these networks of neurons are used, the stronger they become...the more easily they are accessed and information recalled.

The brain has many sections that record memory. The first one is the temporal lobe it is also known as "the storage for events." The temporal lobe includes a region that involves long term memory; this region is called the neocortex. Within the neocortex is a group of self-interconnected structures, they perform the functions for previous events. Around the self-interconnected structures are the cortical structures, which are hippocampus these are the connecting ways to other parts of the brain. The hippocampus records important facts and events for your memory, it is also involved with the recognition of spatial areas. Then there is the amygdala also known as "the airport of the brain" it communicates with the systems of the cortex. The amygdala and the thalamus are also connected. This connection provides the memory of sound, smell, taste, sight, and sensation of objects. The connection between the amygdala and the hippocampus provides the memory of emotional reactions or responses. Another part of the brain that is associated with memory is the pre-frontal cortex. This is involved with the solution of problems and decision of behaviour; it is also connected with the temporal lobe and the thalamus. All of these different brain systems can not be formed without neurons also known as brain cells. The neurons must communicate through something called synapse. The synapse contains a chemical substance called neurotransmitters. The more brain cells communicate the more memory is recorded. An important factor that influences what is stored and how strongly it is stored is whether the action is followed by rewarding or punishing consequences. This is an important principle in determining what behaviours an organism will learn and remember. The amygdala appears to play an important role in these memory events (The Society for Neuroscience 2002:22).

The activities that take information from short-term to long-term memory according to Fletcher (2001:43-45) are repetition, using pictures, using colours, imitation, sorting, drama/movement, music/relaxation, making links in the subject concentration spans, humour, and review before sleep.

Figure 2.8. Memory Types



2.1.1.1.7.1. Short Term Memory

We receive a lot of information through our senses during a day. Recognizing patterns means that the information can be sent to the short term memory. This is the first stage of the temporary memory to become a stable long term memory. The short term memory divides into two: immediate memory and working memory. Immediate memory and the working memory include the things we immediately thinking about or working on.

2.1.1.1.7.1.1. Immediate Memory

Sousa (2001:41) says that the immediate memory area as represented in Figure 2.8. is a place where we put information briefly until we make a decision on how to dispose of it. Immediate memory operates subconsciously or consciously and holds data for up to about 30 seconds. The individuals experience determines its importance. If the datum is of little or no importance within this time frame, it drops out the system.

2.1.1.1.7.1.2. Working Memory

The working memory is the second short-term memory and is the place where conscious process occurs. As in Figure 2.8. the working memory is a place of limited capacity where we can build, take apart, or rework ideas for eventually storage somewhere else. When something is in the working memory, it generally captures our focus and demands our attention. Most of the working memory activity occurs in the frontal lobes, although other parts of the brain are often called into action (Sousa, 2001:44).

The brain is constantly taking in sensory stimuli from the outside world, assembling and sorting the stimuli, discarding much of the information, and directing only some of it to our conscious attention. Although consciousness represents a small part of information processing, without it we could not remember an unfamiliar phone number long enough to dial it or recall the first part of a sentence as we are reading its end. Working memory allows us to integrate current perceptual information with stored knowledge, and to consciously manipulate the information (think about it, talk about it, and rehearse it) perhaps well enough to ensure its storage in long-term memory (Wolfe, 2001:90-93).

The working memory can handle few items at once and this depends on the age of the person.

2.1.1.1.7.2. Long-Term Memory

The items in the working memory move to the long term storage for future recall. Information that has survival value is quickly stored. Emotional experiences also have a high likelihood of being permanently stored. We tend to remember the best and worst things that happen to us. Information is likely to get stored if it makes sense and has meaning (Sousa 2001:46).

We begin to get some idea of the complexities of long-term memory when we realize that stored in long-term memory is everything we know about the world. Not only is this vast amount of information stored in long-term memory, each piece can be reached by a multitude of pathways (Klatzky, 1980:12).

The brain does not store memories in a linear manner, as a tape recorder or video camera does; it stores memories in neural circuits or networks. The synapse between neurons representing experiences becomes strengthened or potentiated over a period of time. The more often the pattern of neurons is activated, the more efficient the synapse becomes. Amazing changes take place in the neural connections in our brains, and the methods we use to structure learning experiences for our students affect the strength and duration of those changes (Wolfe, 2001:116-119).

2.1.1.1.7.3. Types of Long-Term Memory Storage

There are five memory storage types. These are semantic memory, episodic memory, procedural memory, automatic memory, and emotional memory. Now, these are presented.

2.1.1.1.7.3.1. Semantic Memory

Semantic memory is the type of memory most frequently used in the classroom. When we ask students to learn new vocabulary words or memorize grammar rules, lists, or details of specific content, we call on semantic memory. When we remember information in semantic memory, we do not remember the time or the place and events surrounding the learning of this information itself.

This memory lane is a difficult lane to use for learning because it takes several repetitions of the learning to cement it into the pathway. It has to be stimulated by associations, comparisons, and similarities. In short, semantic memory can fail us in many ways (Springer, 1999:51).

2.1.1.1.7.3.2. Episodic Memory

Episodic memory deals with locations. The important link for this memory lane is that you are always somewhere when you learn something, so you can easily associate the learning with the location. The gateway to the episodic memory lane is in the hippocampus (Springer, 1999:51-52).

Squire (1992:161) defines episodic memory as the form of memory that allows an individual to recollect happenings from his/her past. It is sometimes referred to as autobiographical memory. He continues listing the episodic memory tasks as following:

1. Free recall task-Name the items in the study set or list, regardless of their order.
2. Serial recall or serial reproduction task-Name the items in the list in their proper order.
3. Paired-associate task-Name the item that appeared together with item X.

4. Cued recall task-Name the item in the study list that represents an instance of Category C (or one that rhymes with Word W, or fits into the sentence frame S).
5. Free-choice (or Yes/No) recognition task-Did item X appear in the study set?
6. Two-alternative forced-choice recognition task-Which of these two items, X or Y, appeared in the study set?
7. (Absolute) Frequency estimation task-How many items did item I occur in the study list?
8. (Relative) Recency judgement task-Which of these two items, X or Y, appeared earlier (or later) in the study list?

Events recalled in the memory are often emotionally charged, positively or negatively. Emotion is a hook that helps us remember events and episodes in our lives. Episodic memory provides important clues to the teacher. If we want to help the students in our classroom to remember important information, we need to hook the information to a positively emotional episode in the classroom.

2.1.1.1.7.3.3. Procedural Memory

Each time we participate in any endeavour, a certain amount of neurons are activated. When you repeat an action, these same neurons respond again. The more you repeat the action, the more efficient your brain becomes. As Springer (1999:52) states that is why it is called the “muscle memory. Eventually, you need only the beginning of an action, and then you go on without having to think about it. This type of memory, developed through repeated actions, is called procedural memory. Sousa (2001:82) also states that procedural memory helps us to learn things that don’t require conscious attention and to habituate ourselves to the environment. We use this type of memory many times through the day in brushing our teeth, tying our shoes, and getting dressed. Springer (1999:52) states that the part of the brain that

stores this information is the cerebellum. The storage of procedural memory has given humans the ability to do things at once.

2.1.1.1.7.3.4. Automatic (Sensory) Memory

A great deal of what we call is automatic. So much information comes to us simultaneously that to handle such a large number of information our brain has learned to delete and sort information automatically. What is dropped from the sensory memory is gone forever.

It can also be said to be the response memory. The automatic memory lanes are located in the cerebellum. Your automatic memory may cause other memory lanes to open. Something that entered the automatic memory can cause a memory in other lanes to activate (Springer, 1999:53).

2.1.1.1.7.3.5. Emotional Memory

The emotional memory lane is opened through the amygdala, located in the forebrain next to the hippocampus. Whereas the hippocampus files factual information, the amygdala stores emotional information. This part of the brain holds information containing all sorts of experiences that made you happy or sad, or any other feeling you can name. The brain always gives priority to emotions. When information enters the brain and reaches the thalamus, the amygdala will grab that information if it's emotional and go straight to work on it. If the information calls for strong emotion, especially fear, the amygdala takes over to prepare the body (Springer, 1999:54).

Sousa (2001:83) states that sometimes an experience is stored merely as an emotional gist or summary of the event. that is. we remember whether we liked it or not. A year after seeing a movie, for example, we might be able to recall only bits of

the storyline and perhaps its mood. Students often can remember whether they liked a particular topic, but cannot recall many details about it.

2.1.1.2. Spinal Cord

The spinal cord is a large bundle of nerve fibres which starts from the base of the brain and goes down to the middle of the back.

“The chief job of the spinal cord is to carry messages between the brain and the body. It does this by way of two major corti-cospinal tracks, the ascending pathway and the descending pathway. The ascending pathway takes in sensory information, such as pain, temperature, light and touches from the body’s sensory receptors and relays it to the specific brain regions that process these different types of sensations.... The descending pathway works in the opposite direction, carrying motor nerve signals from the brain to the body’s muscle to cause movement.” (Wolfe, 2001:20)

Every movement is made by the signals sent to the body by the brain with the use of the spinal cord, a collection of neurons and supportive tissue running from the base of the brain down the centre of the back. It is also protected by spinal column.

2.1.2. The Peripheral Nervous System

The peripheral nervous system consists of the somatic and autonomic (sympathetic) nerves.

Somatic nerves include the nerves that are connected to sensory receptors and skeletal muscles. The sympathetic nervous system mobilizes bodily resources and increases the output of energy during emotion and stress. The parasympathetic nervous system operates during relaxed states and that conserves energy. It can also be said that speed is sympathetic.

2.2. Creating a Brain Compatible Classroom

In creating a more compatible classroom for university students the teacher should bear in mind that she/he must focus on holistic teaching and creating a classroom environment which is not threatening and the activities should focus on the students' intelligences, learning styles and emotions. The environment should also be enriched for the students to have different alternatives addressing their learning styles. To gain a better and faster result in the learning process supporting cooperative learning, using physical activities, having music played in the background or within according to the subject, using art to create a better relationship and concentrate on the details, making the students laugh and have fun during the learning of the materials and allowing an assessment that allows the students to evaluate themselves and each other will be useful and booster the learning process. In other words create an atmosphere that prompts holistic learning in a non-threatening environment. The difference between traditional teaching and holistic teaching is given in the Chart.

Chart 2.2. Teaching Models

Comparison of Teaching Models		
Elements of Orchestration	Traditional Teaching	Brain-Based Teaching
<i>Source of Information</i>	Simple. Two-way, from teacher to book, worksheet, or film to student	Complex. Social interactions, group discovery, individual search and reflection, role playing, integrated subject matter.
<i>Classroom Organization</i>	Linear. Individual work or teacher directed.	Complex. Thematic, Integrative, cooperative, workstations, individualized projects.
<i>Classroom Management</i>	Hierarchical. Teacher controlled.	Complex. Designated status and responsibilities delegated to students and monitored by teacher.
<i>Outcomes</i>	Specified and convergent. Emphasis on memorized concepts, vocabulary, and skills.	Complex. Emphasis on reorganization of information in unique ways, with both predictable outcomes,

divergent and convergent, increase in natural knowledge demonstrated through ability to use learned skills in variable contexts

(Caine and Caine, 1991: 124)

As for Fogarty (2002: 62) the following are ways to structure interaction in a brain compatible classroom:

- Use cooperative learning.
- Utilize graphic organizers.
- Target multiple intelligences
- Design integrated curricula.
 - Create performance tasks.
 - Develop thematic units.
 - Do problem-based learning.
 - Design projects or service learning opportunities.
 - Use case studies.

Again Fogarty (2002:64) states that through reflection, metacognitive monitoring, and explicit transfer strategies, the process becomes more brain compatible or aligned to how the brain puts learning into long-term memory.

The following are ways to teach thinking about thinking in the brain compatible classroom:

- Create personal relevance.
- Construct knowledge.
- Foster deep understanding.
- Make generalizations.
- Promote mindful engagement.
- Use mediation strategies.

- Embrace metacognition (plan, monitor, evaluate).
- Move to application.
- Shepherd the transfer of learning.
- Check for understanding (traditional assessment, dynamic assessment)

2.2.1. Teaching to Both Sides of the Brain

It can be said that although the left and the right hemispheres have different functions they rely to each other for any action.

To say that one side of the brain is logical or one side is creative is wrong because people can become very creative by following and using logical options, patterns, variations and sequences. The work of DeBono on lateral thinking reminds us that one can use “systems” to be creative. Using the left side of the brain can produce “creative” results. In other words, each side of the brain relies on the other and each is part of a larger “whole” (Jensen, 1994:4).

Traditional schools (optimal learning) usually focus on the logical part of the brain.

“The different functions of the right and left hemispheres of the brain require different approaches to education. Due to their emphasis on language and verbal processing, schools have failed to give adequate stimulation to the right side of the brain and thus tend to discriminate against right brain dominant students. Many students show a preferred right brain (intuitive) thinking style and consequently have struggled in school because their thinking style did not conform to typical left brain or logic based (Springer and Deutsch, 1998:299).

Also Jensen (1996:17) includes that both parts and wholes are important to learning. Neither should be emphasized at the cost of the other. Some of those who are promoting “right-brain thinking” might do more good by promoting “whole brain thinking.” Provide learners with global overviews. Provide them with a sequence of steps that will be followed. If you use an overhead transparency, first show all of it, or

all of your overheads for the day or for the whole course. Then you can sequence them, one idea at a time. Alternate between the “big picture” and the details. Validate that we are “whole brain learners”.

Characteristics of the left brain learner: Remembers names, words are important, logical, abstract thinker. serious minded, likes to plan, problem solver, sequential thinker, emotionally inhibited, systematic, objective. analytical, responds to auditory instruction, prompt and punctual, fanatic, and single-minded. Characteristics of the right brain learner: Remembers faces, responds to visual and kinaesthetic instruction, artistic, musical, improvises emotional humorous, creative, playful, intuitive in problem solving, highly psychic, subjective, into body language, holistic outlook at life. more athletic. prone to be late and 'spacey'. Characteristics of the balanced brain learner: between left and right- a combination, a nice balance of the two extremes. Since no one hemisphere dominates, you may never reach full potential of talents characteristic of the extremes. So, you'll never be a surgeon or an Olympic marathon runner... but think about sales, teaching, or politics.

Each hemisphere has specific strengths. The left does seem to favour analytical, logical, time-sensitive processing. The right seems to be more holistic, intuitive, involved with sensory perception rather than with abstract cognition. Whilst this is a useful distinction for us as teachers, we need to be a little wary of generalizations. Even language, usually regarded as a definite left hemisphere attribute, is organized atypically in about five per cent of people. Again, as teachers, we will be interested not just in the different strengths of the two hemispheres, but in how they engage together in the learning process (Fletcher, 2000:10).

Deepak Chopra (quoted by Caine and Caine, 1991:12) also implies that nature is like a radio band with infinite stations; the reality you are now experiencing is only one station on the band, completely convincing as long as you stayed tuned to it, but masking the other choices that lie on either side. So same in the classroom and the teaching method the teacher selects is just as Deepak Chopra focuses and not only

one station but a big variety of stations should be used in the learning to cover all the students in a variety of choices.

One another factor is teaching the text in a context which means teaching to both halves of the brain. Wolfe (2001:48) states that context (the text in which the left hemisphere excels) is important, but text without context (the specialty of the right hemisphere) is often meaningless. We need to teach content within a context that is meaningful to students, and that connects to their own lives and experiences.

The development of each area of the brain must be considered as we decide what to teach and how to teach it. Through an understanding of development and function of the brain, we can work toward an understanding of learning and memory (Sprenger, 1999: 43).

Finally we can include as Fogarty (2002:160) saying two brains are better than one. And also as Dewey (quoted by Wolfe, 2001:139) states school should be less about preparation for life and more like life itself.

2.2.2. Focusing on Intelligences

As it is known the theory of multiple intelligences were developed by Howard Gardner and he put forth that the human intelligences have the following characteristics:

- “— A set of skills that enable a person to resolve genuine problems encountered in life.
- The ability to create an effective product or offer a service that is valued in a culture.
- The potential for recognizing or creating problems, there by establishing the necessity for the knowledge.”

(Gardner, 1983:10)

Fogarty and Bellanca (1995:182) states that each person exhibits a unique intellectual profile with preferred methods of approaching and solving problems.

Therefore Gardner (1983:70) claimed that there are at least seven different intelligences that each person possesses which are verbal-linguistic, logical-mathematical, bodily-kinaesthetic, visual-spatial, musical, interpersonal, intrapersonal and later on he added another type of intelligence; naturalistic intelligence. He also added that there can be additional intelligences that are not identified at the moment.

One another aspect that Gardner (1985:48) apposed is that the traditional education system focused on only two kinds of intelligences that are verbal linguistic intelligence and mathematical-logical intelligence so when the other intelligences are not focused in a classroom, the learners which have different dominant intelligences can not learn or have difficulty in accessing the information.

Not only is it important for teachers to recognize the intelligence in the students mind/body systems, but also realize that it is possible to create “smart environment” in which to live and learn. Intelligence extends by and individuals is enhanced through interactions with other people, through resource materials in books and database and through the tools we use to think, learn and problem-solve such as pencils and paper, notebooks and journals, calculators, and computers (Chambell, 1996:xxi).

Hoerr (1996:25) continues that there is no one right way to implement multiple intelligences, there is no one model for a “multiple intelligence classroom”. But there are several characteristics that are common to classrooms grounded in multiple intelligence theory. For example teachers can make an extensive use of learning centres and activity stations, small-group discussions and alternative assessment practice.

It is better for the teacher to identify the learners' dominant intelligence and as Lowes and Target (1998:30) focus while individuals may have a preference to learn using their strongest, the most effective, most balanced way to learn is to try to involve all the intelligences. It is also important for learners' general intellectual development.

2.2.3. Identifying and Addressing Learning Styles

Humans learn with the input gained from their senses which are seeing, hearing, feeling, smelling, and tasting. Teachers must identify which style is dominant to their learners and as Sprenger (2002:74) suggests once students know that they are capable of learning, and their brains are ready to learn, the next stop is for the teacher to decide what kind of approach to take to teach them.

In a classroom only three of the senses are used to the learning approach; seeing; hearing and feeling. The students that use these senses are called visual learners, auditory learners and kinaesthetic learners.

Students who are visual learners like to take information through their eyes. They like to see things written down, read books, look at pictures, diagrams and so on. Students who are auditory learners like to get information through their ears. They like to hear things being said, listen to cassettes, perhaps even have a chance to repeat things in their own head. Students who are kinaesthetic learners like to get information through their hands or bodies or emotions. They like to touch things, move their hands or feet, walk around the room (Revell and Norman, 1999:31).

Any individual is with a mixture of characteristics: it is very unusual for anyone to be a pure example of learning style. Often people can learn best by the use of a mixture of learning styles. Encourage students to try learning different ways by exposing them to lots of activities in their class. They might find a better way to learn.

The teacher should identify the students learning styles and design the course which includes all of the styles because as Lowes and Target (1998:28) advice teachers that many teachers tend to be abstract thinkers who are analytical and organized in their approach to learning. They have been successful in an education system which rewards logical skills. Remember that many of your students will not have them natural tendencies as you, and if you are to help them to learn successfully you need to appreciate their differences and cater for them as best you can.

The teacher should design the course according to the mixture of the styles. but in traditional classes the teacher usually teaches according to his/her own style and should take into consideration the facts Jensen (1996:130) puts forth as seventy five percent of presenters are sequential, analytic presenters that is how their lesson is organized... Yet 100% of their participants are multi-processors.

2.2.4. Creating an Enriched Environment

One of the most important factors in learning is the environment (classroom) we learn or teach. In traditional classes there are desks which students sit stiff and listen to the teacher. Jensen (1994:299) states that with increasing amounts of environmental enrichment, we see brains that are larger and heavier, with increased dendritic branching. That means those nerve cells can communicate better with each other. With the enriched environment we also get more support cells because the nerve cells are getting bigger. Not only that, but the junction between the cells—the synapse—also increases its dimensions. These are highly significant effects of differential experience.

Ford (quoted by Jensen, 1994:305) states that optimal motivating environments had four critical functional elements. These are as follows:

- 1) The environment must be consistent with an individual's personal goals. This means that the learning environment must be a place in which the learner can reach his or her own personal goals.
- 2) The environment must be congruent with the learner's bio-social and cognitive style. This means that if abstract learning is taking place in a crowded, competitive room with fluorescent lighting, it will be a problem for a concrete learner who needs space and works cooperatively.
- 3) The environment must offer the learner the recourses needed. In addition to materials, advice, tools, transportation, and supplies, another key resource is time and affordability.
- 4) The environment must provide a supportive and positive emotional climate. Naturally, trust, warmth, safety and peer acceptance are critical.

In a learning environment learners are affected most of light, colour, darkness, motion, form, and depth. So an enriched environment should include colour choices, seating options, room arrangement, maybe plants, effective and sufficient lighting, music, artefacts, peripherals and etc.. The teacher, in creating an enriched environment, can use impact videos, strong posters, mind maps, vivid drawings and symbols (Jensen 1996:55-62).

Jensen (1994:301) advises the teachers to be more purposeful about the learning environment. Reduce television watching time. Create a more multi-sensory environment. Add posters, aromas, music and more engaging and relevant activities. Increase social interaction. Use different rooms and, if possible, larger rooms, too. Change the environment often to create novelty and challenge.

In turning a classroom to an enriched classroom environment Lock and Prigge (2002:237) suggests to create an interactive environment. The brain learns best with active rather than passive learning (doing vs. absorbing). Transform your classroom into the learning environment by bringing the content to life.... Get your

students involved in creating the environment, instead of having the classroom consist of just teacher displays. Also Olsen and Kovalik (2001:6) include that a classroom should be healthful (safe, free of toxins, clean, well lighted, and well ventilated with air fresh and pleasant smelling and at an appropriate temperature), aesthetically pleasing (calming colours and music, living plants, and well laid out for multiple uses), uncluttered yet reflecting what is being learned, seating is arranged in clusters with easy access to work tools.

Strategies that Fogarty (2002: 109) for creating an enriched environment is as follows:

Organizational Enrichments

- Student Grouping
- Blocks of Time
- Year-Round Schools
- Room Arrangements and Facilities

Sensory Enrichments

- Equipment and Supplies (availability, accessibility, flexibility)
- Sensory Input (touch, smell, hear, see, taste)
- Language Stimulation (print rich, language rich)
- Learning Centres

Briefly it can be said that a classroom should be best including pedagogical and practical aspects.

One another factor in enriching the environment is as Dunn and Dunn (quoted by Jensen, 1996:107) say that at least 20% of learners are significantly affected, positively or negatively, based just on the type of seating options. To be at their best, they need to have choice. Some participants need the floor, a couch or beanbag furniture to be at their best in learning.

Using colour in the environment and learning process is an effective instrument, as well. Stronge (2002:28-29) state that the use of colour-coding to assist a teacher or student is a quickly locating material. If multiple preparations are required of a teacher, colour coding bins or folders (one colour per subject) can optimize organization. Also Jensen (1996:57) states that different colours affect people's mood and learning. Researches show that colours affect people depending on 1) personality and 2) the person's state of the moment. Jensen continues listing the ways that colour can affect:

Red is an engaging and emotive colour. It is considered more disturbing by the anxious subjects. and more exciting to those who are calm. Triggers the pituitary gland, adrenal gland and finally, adrenalin is released. Blood pressure may elevate, increased breathing, stronger appetite and smell.

Orange has the characteristics halfway between red and yellow.

Yellow is the first colour a person distinguishes in the brain. Associated with some stress, caution and apprehension.

Blue calmed the tense subjects, increased the feeling of well-being. Researchers say sky-blue is the most tranquilizing colour. When you see blue, your brain releases 11 neurotransmitters that bring relaxing calmness to the body. The effects that can lower the body temperature, reduce perspiration and appetite.

Green is also a calming colour. The body reacts in many ways: blood histamine levels are elevated, less sensitivity to food allergies, antigens are stimulated for overall better immune system healing.

Darker colours lower stress and increase feelings of peacefulness.

Brown promotes a sense of security, relaxation and reduces fatigue.

Brighter colours such as red, orange and yellow spark energy and creativity. They can also increase aggressive and nervous behaviour.

Gray is the most neutral colour.

Lighter colours are best for optimal learning: choose yellow, beige or off-white. Those colours seem to stimulate positive feelings.

For a language classroom Jensen (1996:315) suggests these to be done:

- A complete immersion environment stimulating a foreign country completely with music, poster & dress
- All mistakes pointed out directly, emphasis on using the skills, save the grammar for later at the advanced levels (learn it by way we learned our native language)
- Absolute minimum of grammar, syntax and rules (save it for highest level)
- Use of music, role-play and celebrations
- Real-life situations, no textbook learning; learning is thematic everywhere
- Use of alternative characters; puppets, assumed identities participants take on full characters and roles
- Multiple contexts for memory embedding: inside and outside the classroom, a restaurant, a civic event, a festival

2.2.5. Setting a Safe and Secure Environment

Until present, no one through that fear and emotions had an influence on learning. With the studies done on the brain and especially the amygdala which controls emotions have shown great respect. Vincent (quoted by Jensen, 1998:53)

said that when we feel stressed, our adrenal glands release a peptide called cortisol. Our body responds with cortisol whether it faces physical, environmental, academic, or emotional danger. This triggers a string of physical reactions including depression of the immune system, tensing of the large muscle, blood- clotting, and increasing blood pressure... In school these kinds of responses lead to problems. Chronically high cortisol level lead to the death of brain cells in the hippocampus, which is critical to explicit memory formation.

The brain making maximum connections when risk taking is encouraged and supported: however, it “downshifts” (helplessness) when under perceived threat. Research tells us that threatening learners may foster more of the same behaviour that we are trying to avoid. A threat is any stimulus that causes the brain to trigger defensiveness or a sense of helplessness in the learner (Jensen, 1994:222).

When the learner is downshifted, they revert to early programming or instinctive behaviours and lose much of their capacity to think creatively and tolerate risk, uncertainty, and ambiguity. In effect, they experience the opposite of self-efficiency (Caine and Caine. 1997:95).

The solution is for teachers to begin by harmonizing with the barriers of students. When we respect their current views and provide them with the appropriate degree of safety and opportunity to creatively explore, then we can take them beyond their immediate limitations. That is the nature of the challenging that good teachers provide (Caine and Caine, 1997:81).

Also Butler (1998:37) stresses the fact that when a student feels threatened in any way, not even the most creative teaching will be stored in long-term or short-term memory.

The teacher should avoid threat by encouraging and overcoming the threat of failure or low grads. By downshifting you can make them memorize by making them repeat the students over and over again but this is technique used in traditional

classes and brain compatible learning should make connections, make high-order thinking, and making creativity in the environment so the setting is a safe and secure environment. These were also stated in Krashen's low anxiety and high confidence and Lozanow's overcoming the language barriers. To overcome threat and downshifting Caine and Caine (1997:91) recommend to maintain a balance- make a rich environment with stimulations, and yet be imbued with orderliness and care.

The third part of the brain, the cerebrum, is the "thinking" brain. This is the home of higher-order thinking skills, where learning takes place. Being harassed or made fun of and fearing failure all cause a downshifting out of the cerebral cortex (where information is stored) to the brain stem (where the fight or flight mechanism takes control) (Butler, 1998: 137-138).

If the student comes to school in the morning a state of arousal or alarm, the slightest negative incident could be perceived as fearful or terrifying. It is often difficult to obliterate threatening practices because they seem to be embedded in the cultural core of schools and classrooms (Stevens and Goldberg, 2001:45-46).

In constructing a safe and secure environment for the students, the teacher should prepare the classroom first. The classroom should have different seating possibilities according to the activity done. Again there should be colourful posters, charts, graphs, etc. to foster the learning and an alternative colour sequence which helps students learn and overcome stress and threat. Also Stevens and Goldberg (2001:97) state that developing leadership capacities in students, while using an inclusive classroom environment to strengthen community spirit, will create cultures that support healthy brain development.

According to Kaufeldt (1999: 21-41) to reduce stress and threat, pictures, personal posters, real things from home, plants, flowers, if possible pets, sounds from nature, couches and cushions, and the activities which allow them to be actively, physically and psychologically involved.

2.2.6. Using Physical Activities

Using physical activities during the lessons will booster the learning process. Cousins (quoted by Caine and Caine, 1991:63) states that at one time, a compartmentalized view of the human body was generally accepted. Recent knowledge of the anatomical and functional links between brain and body point in a different direction. Brain researchers now believe that what happens in the body can affect the brain, and what happens in the brain can affect the body. Hope, purpose, and determination are not merely mental states. They have electrochemical connections that play a large part in the working of the immune system and indeed, in the entire economy of the total human organism. Also Revell and Norman (1999:20) states that your mind affects your body and your body affects your mind. If your state of mind is good, you tend to feel good physically too. And the better your body feels, the better your mind functions. It is also true that activating the body activates the mind. So does Wolfe (2001:101) confirm that you don't learn to swim or play the piano by reading a book about it. So in this case can we learn English just by reading books about it and doing exercises just sitting in our seats.

The cerebellum is a relatively small part of the brain, but it contains more than half of all its neurons. It has as many as 40 million nerve fibres that supply information to and from the cortex. A leaning cycle begins as the cerebellum coordinates the body and assist in physical movement. The resulting muscular activity actually stimulates the growth of dendrites, which in turn increases the size of the neural network. As the network grows, more and more connections are made in the brain. The more connections we have within the brain, the greater the opportunity for us to learn (Stevens and Goldberg, 2001:28).

Jensen (1998:85-86) also states that as the way that exercise shapes up the muscles, heart, lungs, and bones, it also strengthens the basal ganglia, cerebellum, and corpus callosum, all the key areas of the brain. We know exercise fuels the brain with oxygen, but it also feeds it neurotrophins (high-nutrient food) to enhance growth and greater connections between neurons.

The ability to maintain learning attentiveness, or focused attention, is affected by fluctuations in brain chemistry. We know that this occurs at 9-minute cycles across a 24-hour day. This is a naturally occurring phenomenon, and reveals that the brain alternates periods of focus and non-focus, or focus and diffusion. The French researcher Picron discovered that our brain learns best when learning is interrupted by breaks of two to five minutes for diffusion, or processing. In addition, we also know that the optimal learning pattern corresponds to our age plus or minus two minutes, up to a maximum of 20-25 minutes. In other words, if the age of your learner is 19 they focus for approximately 17 to 21 minutes. At which time, to maximize the moment of learning and increase retention and comprehension, it is necessary to do a diffusion activity for about 2-5 minutes. These “breaks” in the learning can either be a total break from content or an alternate form of learning the content: peer teaching, reflective writing, iconic representations, etc. (Reardon, 1999:9).

So it is a fact that using physical activities during the lessons support the brain to function better and the memory to activate better. For the choice of physical activities Jensen (1996:149) suggest of using these activities more: 1) slow stretching and breathing to increase circulation and oxygen flow to the brain 2)use energizers every 20 minutes 3)make sure that some of your planned activities have a built in component of physical movement (going outside to do a project, working on jigsaw puzzles, etc.) 4) The hand manipulative are useful for the brain, let participants hold, mold, and manipulate clay or other subjects. This could actually stimulate the brain. Give your participants permission to get up on their own to move around, stretch or do an errand, so that they can monitor and manage their own energy levels. 5) Have your participants’ move, manipulate and exercise their hands each day. Use clapping, dancing, puzzles, manipulative. Invent new ways to shake hands or greet another.

2.2.7. Using Music

It is a fact that music activates learning was first identified in the studies done on September 1, 1994, on Mozart's music and a special edition was devoted to the music of Mozart. Researchers say, listening to selected compositions of Mozart during either active or passive learning can measurably increase spatial learning, memory and reasoning (Jensen 1996:217).

Music carries meaning and the brain's response to that meaning is shown in right hemisphere activity. Language is primarily left hemisphere function but the right hemisphere also becomes involved when words carry emotional meaning. Music has a role in synthesizing brain activity... In the limbic system, auditory input is directly associated with memory, feelings, mood. The highly developed frontal lobes process intellectual pleasure in musical form. Their sophisticated responses to music include imagination, creativity, and personality development (Fletcher, 2001:116).

According to Veron (quoted by Swanwick, 1998:23) categories of musical response are:

- 1) Physical (the actual sensation of the sound)
- 2) Free trains of thought (day-dreaming to music)
- 3) Emotional reaction (especially dramatic or visual associations)
- 4) Muscular reaction (including the delicate and complex adjustments that attend every perception)
- 5) Synaesthesia (particularly the link of musical key and visual colour)
- 6) Auditory images and intellectual processes (analytical and technical)
- 7) Social and temperamental factors.

One another important aspect is that has been proved is that the musical improvement and language processing occur in the same area of the brain, and there appear to be parallels in how musical and linguistic syntax are processed (Maess & Koelsch, 2001:1).

Sousa (2001:234) suggests that music as background to facilitate student work should be chosen that plays about 60 beats per minute (the average heart beat rate). If the music is accompanying a fast-pace activity, then choose 80 to 90 beats per minute. To calm down a noisy group choose music at 40 to 50 beats per minute.

Seemingly the same Jensen (2003:1-3) suggests that using music in the classroom accords to the function of the brain and the affects of music which should be in the calming 35-50 BPM, more moderate 50-70 BMP (busy working), and faster pace 100-160 BPM which will rev up the energy. He also gives advices on which music to use in the state of condition:

In Arousal States

Flight of the bumble bee, Good morning (Peter Gynt), Toy Symphony, March of the Toy Soldiers, Peter & the wolf (Prokofiev), Theme from Rocky (Bill Conti), Triumphal March (Verdi), Wedding march (Mendelssohn), Rackoczy march from Hungarian rhapsody (Liszt)

In high energy states

Whip it (Devo), I'm so excited (Pointer Sisters), I'd like to move it (Reel 2 Reel), Hawaii Five-0 theme (Ventures), We didn't start the fire (Billy Joel), Eye of the tiger (Survivor), William Tell overture (Rossini), Locomotion (Kylie Monogue), 1812 overture (Tchaikowsky).

Celebrate

I feel good (James Brown), I can see clearly now (Johnny Nash), Raiders of lost ark theme (John Williams), Simply the best (Tina Turner).

Relax and Still Alert

Latin Gypsy (CD by Marc Antonie), Whistle while you work.

Positive Lyrics

Reach out- I'll be there (Four Tops), You've got a friend (Carole King & James Taylor), We are family (Sister Sledge), I'll take you there (Staple Singers), I will survive (Gloria Gaynor), Circle of life (Elton John), When you're smiling (Louise Armstrong), Wonderful world (Louise Armstrong).

States for Reflection (Peace and Quiet)

All compositions by George Winston, All compositions by Michael Jones, Piano music (Eric Satie), Goldenberg variations (Bach).

Wolfe (2001:166) states that adding movement to music or rhyme provides an extra sensory input to the brain and probably enhances the learning.

2.2.8. Using Art in Activities

Using art in language teaching allows students to see details, understand relationship (care about others), and learn to think creatively. It also helps to constitute wholes from parts. Sousa (2001:219) states that although learning in other disciplines often develops a single talent or skill, the arts engage many skills and abilities. He also continues saying that the arts reach students in ways they are not otherwise being reached.

As a result of developing skills and capabilities in each of the arts, students: learn to see details, understand relationships, see how parts contribute to making the whole, learn to think creatively.

One another aspect is to use art activities in the class. As Jensen states (1998:88) get your class used to daily or at least weekly role plays. Have students to do charades to review main ideas. Students can organize extemporaneous pantomime to dramatize a key point.

2.2.9. Using Humour

One another factor that fosters learning is laughter and humour. If you add laughter and play to your learning process according to Loomans and Kolberg (1993:33) it will:

- Maintain a high attention level.
- Relieve physical and mental stress,
- Build rapport
- Increase retention
- Enhance self-esteem.
- Promote divergent thinking.
- Bring new insights,
- A low for pleasurable learning, and
- Increase a feeling of hope.

Sousa (2001:63-64) states the benefits of humour as following:

Physiological Benefits

- **More Oxygen.** The brain needs oxygen and glucose for fuel. When we laugh, we get more oxygen in the bloodstream, so the brain is better fuelled.
- **Endorphin Surge.** Laughter causes the release of endorphins in the blood. Endorphins are the blood's natural painkillers, and they also give the person a feeling of euphoria. In other words, person enjoys the moment in body as well as in mind.

Psychological, Sociological, and Educational Benefits

- **Gets Attention.** The first thing a teacher has to do when starting a lesson is to get the student's attention or focus. Because the normal human

brain loves to laugh, starting with a humorous tale (such as a joke, pun, or story) gets the learner's attention.

- **Creates a Positive Climate.** When people laugh together, they bond and a community spirit emerges-all positive forces for a climate conducive to learning.
- **Increases Retention.** We know that emotions enhance retention. so the positive feelings that result from laughter increase the probability that students will remember what they learned.
- **Improves Everyone's Mental Health.** Schools and all their occupants are under more stress than ever. Taking time to laugh can relieve that stress and give the staff and students better mental attitude with which to accomplish their tasks.
- **Is an Effective Discipline Tool.** Good-natured humour (not teasing or sarcasm) can be effective way of reminding students of the rules without raising tension in the classroom. Teachers who use appropriate humour are more likeable and students have more positive feeling toward them. Discipline problems, therefore, are less likely to occur.

2.2.10. Applying Different Kinds of Assessment

One of the major problems in assessment is identifying the level of the learner. In what circumstances should these learners be evaluated and in what circumstances should they be levelled. If we accept learning as a process why don't we accept assessment as a process?

In traditional classes as Fogarty (2002:236) puts forth assessment strategies from traditional measures such as tests, grades, report cards, and conferences to the more dynamic assessment that utilize student portfolios and performance tasks with scoring rubrics. It should include dynamic assessments which are portfolios;

including working, showcase, electronic, performance, including standards or goals, performance tasks or evidence, and scoring rubrics or quality.

In brain compatible classroom, assessment both measures achievement and provides motivation. Despite the fact that schools are required to participate in high-stakes tests, the mere mention of assessment can create threat in the classroom. When students are judged harshly and feel that they are constantly being scrutinized, learning can be inhibited. Assessment in a brain compatible classroom has to be free as free of threat as possible. This may not be easy to accomplish, since the perception of threat is very personal. What may be threatening to one student may not bother another (Stevens and Goldberg, 2001:125).

Parkins (quoted by Sprenger 2002:128-130) states that one important aspect in assessment is the students' internal locus of control to have this information, having the control in their choice of choosing the assessment, the novel and practicable choice of assessment, challenging assessments which include problem solving, decision making, explanation, remembering, planning, evaluation, representation, and prediction. It is the most important factor that shows achievement.

Jensen (1996:288) also advises alternative ways which assessment should include:

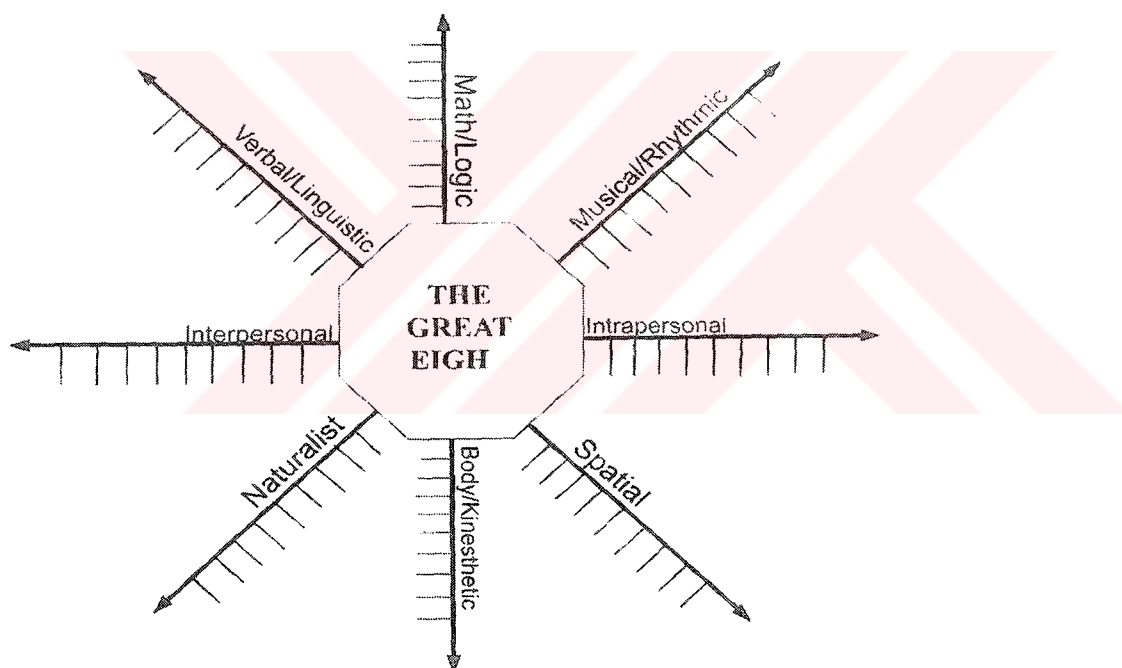
- Increase feedback; both the form and quality
- Students have input on curriculum
- Use grades only as final reports at the end of a term
- Students taught to self-assess
- Assess the real learning that is going on
- Use multiple forms of reporting and assessment
- Avoid rewards of any kind, for effort or results
- Individual assessments get substantive comments, not grades

- Students have input on criteria for assessment
- Utilize a wider variety of evidence of learning
- Grade on mastery, not a bell shaped (or any shape) curve
- Discuss the stakeholders (parents, community) the system you're using, how and why it works & what's expects of each

One another way to assess the students to is give them on self assessment shoot as given:

Figure 2.9. Multiple Intelligences Self-Assessment Chart

Note: Students fill in as many spaces as they think represent their intelligence in each area



(Sprenger, 2002:88)

One factor in assessment according to Kaufeldt (1999:176-182) is there are several ways of assessment as self assessment, small process groups, portfolio assessment, etc... All these assessment must include the students' intelligences, styles, and other factors that influence their learning in the least mood. ...As students begin to understand their own natural strengths, they will know why they are drawn to certain types of activities, projects and other assessment types.

Jensen (1996: 290-291) gives alternative activities in the assessment process as below:

- Students use self-assessment.
- Give participants a choice on type of assessment
- Journal or diary with reflections and personal growth
- Produce a videotape (audiotape)
- Peer assessment (with the teachers established criteria)
- Build working models that demonstrate knowledge
- Students interviews with you
- Make a chart of progress in the course
- Write a story or article
- Perform a play, musical or dance
- Create artwork, a painting
- Graphic organizers like Venn diagrams
- Make an advertising flyer for the course/subject
- Produce a large mind map
- Self-assessment using personal or course goal

2.2.11. Benefits of Brain Compatible Classrooms

The benefits of Brain Compatible Classroom can be listed as below:

- The students learning the structure and the function of the brain realizes that learning is a natural process for everyone, and that everyone can learn everything just if sufficient time is given and the learning and teaching is done appropriate to the brain's natural process.
- Addresses to all the intelligences and styles are a beneficial way in aiming a more brain compatible classroom. Using all kinds of equipments that address the learner's styles and intelligences will booster the learning pace. It

includes activities which include the students to active at according to their strengths. It focuses on all the learning styles which are auditor, visual, and kinaesthetic learners. This allows all the students with these styles to participate voluntarily in the activities because they feel included in them. By doing so, the teacher can reach the entire student's learning diversity. But as Jensen (1996:237) focuses if learners experience stress and anxiety in their environment, they will prefer external motivation, meaning a system of reliable rewards. But in a more brain compatible classroom the teacher focuses on the styles and intelligences, uses music, different colours, movements, art and decreases stress and threat, and by doing so the neurochemicals for the learning is released and the specialized structure of the brain deals with the learning process instead of dealing with the physical and psychological needs of the brain and body. The brain instead of trying to put the body into the preparation of threat and other situations, because of the environment and teaching method, it deals only with the learning and is more easily reachable. In this case Jensen (1996:239) considers that by use of meeting learner goals, peer support, positive rituals, self-assessment, acknowledgements, love of learning, role-modelling, enthusiasm, increased feedback, more options for creativity and learner control over the work intrinsic motivation will be stressed.

- The most important factor is the physical and the emotional atmosphere of the classroom. The classroom must be inviting in both the physical and psychological which will reduce stress and make the students put most of their attention to true subject or activity applied. The students see the connection between the classroom and real life. Olsen and Kovalik (2001:15) state that students direct their own learning by assisting in the development of inquiries and the refinement of key points. They can identify and know how to pursue lifelong interests and career options; in focusing on these efforts, they can apply what they know to real world situations.
- Students focus their attention on learning as soon as they enter the classroom. Because students demonstrate collaborative skills, e.g., active learning, taking

turns and respect for others' opinions. The culture of the classroom nurtures reflective thinking (Olsen and Kovalik, 2001:7).

- Creating a more brain compatible classroom includes learning involving the whole body. Physical activities make the subject to be learned to be placed in the long term memory. If the lessons include activities which they can act, role play, hold, mold, and manipulate clay or other subjects. These will activate the brain parts which will have a long term effect and influence other parts of the body. This will allow them to store the information in the long-term memory.
- Music which is the unexpected event that inferences, music will effect the students unconscious brain rhythm with implying according to the rhythm that effects learning process and the music that can be involved according to the subjects in the lessons. These will booster the learning pace of the process.
- Collaborative learning enhances the good relation between students. decreases threat, allows students actively involve in the activities as a part of the whole. Stevens and Goldberg (2001:84) state that when teachers collaborated with students to develop a sense of interdependence. students become more willing to share recourses.
- One another aspect is the assessment of students. Assessment is done to evaluate the students in a progress and not in an exactly one time, exam or so forth. In assessing students to what criteria should we evaluate? You can not evaluate to one only intellect, style, event, or any other phenomenon because learning process and the students should be evaluated throughout the learning process. One another aspect is to leave the assessment to the learners and make them evaluate themselves by creating the criteria in the process and not forcing them to realize the criteria throughout the process but at the end of the process. These will be evaluated with different kinds of assessment variations as group, project, event, exam, activity, or etc. The students can also self-assess to see their progress by the teacher forming the criteria.

- One last aspect is that after an environment is created and the methods are appropriate in the manner of the brain's learning process, students will not need much instruction, they will be able to understand and do activities on their own.



CHAPTER 3

THE RESEARCH

3.0.INTRODUCTION

In this chapter the method which includes the subjects, the experimental design of the research, experimental phase in the research, means of collecting data, techniques of data analysis, limitations of the research are presented. then the findings and comments take place.

3.1. The Method

In this section of the study, the subjects who participated in the research, experimental design of the research, experimental phases in the research. means of collecting data, techniques of data analysis, and limitations of the research were described.

3.1.1. The Subjects

The first year students who attend Gazi University Kastamonu Education Faculty Primary School Education Department participated in the research as subjects in the academic year of 2003-2004.

The subjects who participated in the research were 14 male and 16 female in the experimental group and 12 male and 18 female students in the control group. The

students had already been grouped into two classes. A and B before the research. One of them was assigned as the experimental group and the other as the control group. The number in the experimental and the subject group was equal, thirty in the experimental group and thirty in the control group. The students in the experimental group took the Foreign Language (English) course being employed in a more brain compatible classroom for six weeks and the students in the control group took the same course being employed in traditional classroom for six weeks, as well.

The research was carried out during the six weeks in the academic year of 2003-2004. The implementation of the research began in the second semester of the 2003-2004 academic years on 16 February 2004 and finished on 26 March, 2004.

3.1.2. Experimental Design of the Research

This research was designed according to pre-test - post-test design and an inventory to identify the student's intelligences, styles and brain dominance. Only one experimental and one control group were included in the research. The research lasted for six weeks and equally thirty students in the experimental group and thirty students in the control group participated into the pre-tests and post-test, which irregular participators were excited from. In the experimental group a more comparative classroom and holistic learning was applied, and in the control group. the traditional classroom and a traditional learning.

3.1.3. Experimental Phase in the Research

One week after the second term of 2003-2004 year began; sixty first year students were given the pre-tests; namely the academic achievement test, the scale of motivation test, and the scale of developing positive attitudes towards brain compatible environment and learning. And an inventory of intelligence, style and brain dominance were also given.

After the pre-test, the two groups were randomly assigned to the experimental group and the control group. The number of the subjects in both groups was equal (n=30). All the students in the experimental group and the control group were accepted as equal according to their academic achievement, so in the control group the students were accepted as equal in their learning process.

At the beginning of the course for the experimental group the process of learning, the brain function and the brain knowledge were given in the first course, so the students had to focus on the fact that learning was not a specific event but a phenomenon that has a function for a period of time according to each learners learning experience, intelligence, learning style, and brain dominance area.

All the proceeds in the research were carried out by the researcher. The course material in the Foreign Language (English) course was the course book Headway Elementary and its workbook. The first six units of the course book and the workbook were studied in the autumn semester in both the experimental group and the control group. In the experimental group, before the study information about the structure and the function of the brain and the general formation of the course was given.

Before each course as a main aspect of brain compatible teaching what the students will learn and the objectives were given. The lessons were presented in the first the most 17 minutes by the teacher, because the students were at the age of 19 and were expected to participate the lesson and communicate in the target language.

The students according to the learning situation received all kinds of stimulation that supported their strength and styles, visualized, auditorisized and kinaestictulized the events which would booster their affects to learning English. The students were acquired to speak English throughout the courses and the teacher observed the whole class if they were working as required.

3.1.4. Means of Collecting Data

The data of the research were collected through the academic achievement test, the scale of motivation, the scale of developing positive attitudes toward learning English in brain compatible class, inventories of intelligences, styles and brain dominance. All of the tests, scales were given to the participants as pre-tests before the research. and they were given as post-tests after the research. Before the pre-tests, the academic achievement test was given to the second year students at Gazi University, Kastamonu Education Faculty Primary School Education twice within a week interval in order to measure the reliability of the test. The inventories of intelligences, styles and brain dominance were given at the beginning of the study.

The academic achievement test was developed to measure grammar and vocabulary at elementary level. This test consisted of 100 items. The test included fill in gaps, open ended questions, choosing the right word, reordering, jumbled sentences, choosing from multiple options, matching, competing sentences, and rewriting sentence types. In order to ensure the validity of the test it was submitted to other teachers' views and their suggestions were taken for improvement. The test was applied to a different group than the experimental and the control group as a pre-test and a post-test. The reliability of the test was computed by Cronbach Alpha test. The reliability coefficient of the test computed by this method was the following: 0,82.

The scale of motivation was aimed to develop to measure how motivated the students were to learn English. The scale was Likert type consisting of 10 items. All of the items consisted of the options a)I completely agree=4 points, b)I quite agree=3 points c)I partly agree=2 point, and d)I do not agree at all=1 point. In order to ensure the validity of the scale, it was submitted to the views of other teachers to review it and give suggestions or provided improvement.

The scale of developing positive attitudes towards learning English in a more compatible classroom was developed to measure how the students' attitudes towards

learning English increased by a more brain compatible classroom and learning. The scale was Likert type consisting of 20 items. All the items consisted of the options a)I completely agree=4 points. b)I quite agree=3 points. c)I partly agree=2 point. and d)I do not agree at all=1 point. In order to ensure the validity of the scale, suggestions of other teachers were given to submit and their views were submitted for improvement.

The inventory of intelligences was developed to identify the student's dominant intelligences and consisted of ten questions for each of the eight intelligences, with a total of eighty questions. The graphs were prepared in accordance with the student's answers to eighty questions which were grouped according to the eight intelligences. The sum of the yes and no answers were shown in the graph which identified their dominant intelligences.

The inventory of styles consisted of twelve questions with three choices of answer A to identify the visual learners, answer B to identify the auditory learners and answer C to identify the kinaesthetic learners. The learners were to give numbers from 0 to 4 meaning; 4=always, 3=often, 2=sometimes, 1=seldom, 0=never. The students were to give numbers to the question which fits them. According to the given numbers to the answers A, B, and C was totalled separately. The students' primary dominant learning style, secondary dominant learning style and the tertiary dominant styles were identified and presented in charts and graphs.

The inventory of brain dominance consists of thirty seven questions having an A and B choice. The total of the A answers to questions 1, 3, 7, 8, 9, 13, 14, 15, 19, 20, 21 and the total of the B answers to the questions 2, 4, 5, 6, 10, 11, 12, 16, 17, 18 were summed (A+B). To the result it was determined as following:

- 0-5 Left hemisphere dominant (Strongly)
- 6-8 Moderate left hemisphere dominant
- 9-12 Both hemispheres equal dominant
- 13-15 Moderate right hemisphere dominant

16-21 Right hemisphere dominant (Strongly)

The results will be given in charts and graphs.

3.1.5. Techniques of Data Analysis

In data analysis, the independent samples t test was used. The Independent Samples t test compares means for two groups of cases. The Independent Sample t test was used to compare the means of the experimental group and the control group in the pre-tests and the post-tests. These statistical techniques were explained in the findings section.

3.1.6. Limitations of the Research

The variables examined in the research were limited to the scope of certain means of measurement such as tests and scales, the validity and reliability of which were pre-tested. Also the results of the inventories were measured according to the given answers.

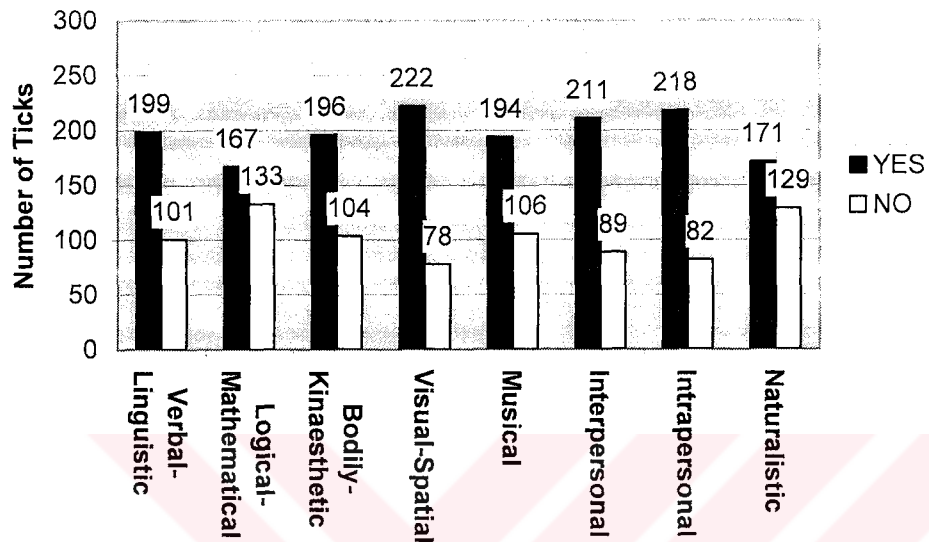
The variables examined in the research were limited to academic achievement, motivation, the students' attitudes towards learning English in a more brain compatible classroom, brain hemisphere dominance inventory, style inventory, and intelligence inventory.

3.2. Findings and Comments

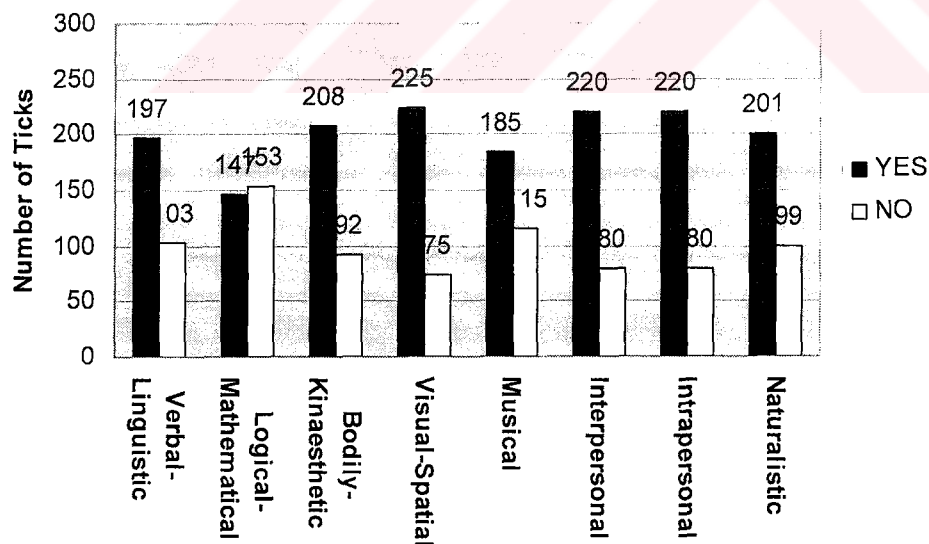
In this section of the study, the analysis of the collected data through the means of measurement such as tests, charts and scales, and findings from the analysis of the data and the discussion of the findings are presented.

3.2.1. Results of the Intelligence Inventory

3.1. Experimental Group's Intelligence Graphic



3.2. Control Group's Intelligence Graphic



Students who have a dominant verbal-linguistic intelligence always want to use words, language and its structures. Logical-mathematical intelligence dominant students tend to reason, calculate, evaluate, and try to solve problems non-verbally.

Dominance of bodily-kinaesthetic intelligence needs to move around; walk, dance, demonstrate, and so on. Students having visual-spatial intelligence as a dominant intelligence have the ability to form a mental model of the spatial world and visualize the objects from different angles. Musical intelligence dominant students respond to music easily. They like to play or act in every melodic activity. Interpersonal intelligence dominant students have the capacity to work with others and always tend to do so. Students who have intrapersonal intelligence dominance access to their own feelings and work with distinction of other peoples temperaments. Naturalistic intelligence dominant students enjoy and draw strength from the natural world.

3.2.2. Results of the Learning Styles Inventory

3.3. Experimental Group's Learning Styles Chart

	VISUAL	AUDITORY	KINAESTHETIC
PRIMARY	24	3	5
SECONDARY	5	15	11
TERTIARY	1	12	14

As it can be seen in Chart 3.3., 24 students have visual learning styles. 3 of them auditory and 5 of them kinaesthetic as their primary learning style. Two students have visual and kinaesthetic learning styles as their primary learning styles equally. 5 of the student's secondary learning styles are visual, 15 of them are auditory, and 11 of them are kinaesthetic. One student has secondarily dominance of visual and auditory learning style equally. 1 student is visual, 12 auditory and 14 kinaesthetic learners as their tertiary learning style.

3.4. Control Group's Learning Styles Chart

	VISUAL	AUDITORY	KINAESTHETIC
PRIMARY	22	2	6
SECONDARY	7	12	11
TERTIARY	1	16	13

Shown in Chart 3.4., 22 students have visual learning styles. 2 of them auditory and 6 of them kinaesthetic as their primary learning style. 7 of the student's secondary learning styles are visual, 12 of them are auditory, and 11 of them are kinaesthetic. 1 student is visual. 16 auditory and 13 kinaesthetic learners as their tertiary learning style.

Students who have primarily visual learning style take information with their eyes. They like information given in the written style, pictures, charts, graphs, diagrams and so on. Students who have primarily auditory learning style take information through their ears. They prefer information given in repetition, cassettes, songs and so on. Students who have primarily kinaesthetic learning style take information with their hands, bodies and emotions. They have to move around, walk, demonstrate or act it out.

3.2.3. Results of the Brain Dominance Inventory

3.5. Experimental Group's Brain Dominance Result Chart

Left hemisphere dominant (Strongly)	1
Moderate left hemisphere dominant	6
Both hemispheres equal dominant	21
Moderate right hemisphere dominant	1
Right hemisphere dominant (Strongly)	1

As a result of the inventory 21 students have an equally dominance hemispheres, 7 of them have left hemisphere dominance and 2 of them have right hemisphere dominance.

3.6. Control Group's Brain Dominance Result Chart

Left hemisphere dominant (Strongly)	1
Moderate left hemisphere dominant	7
Both hemispheres equal dominant	15
Moderate right hemisphere dominant	6
Right hemisphere dominant (Strongly)	1

Characteristics of the left brain learner: Remembers names, words are important, logical, abstract thinker, serious minded, likes to plan, problem solver, sequential thinker, emotionally inhibited, systematic, objective, analytical, responds to auditory instruction, prompt and punctual, fanatic, and single-minded.

Characteristics of the right brain learner: Remembers faces, responds to visual and kinaesthetic instruction, artistic, musical, improvises emotional humorous, creative, playful, intuitive in problem solving, highly psychic, subjective, into body language, holistic outlook at life, more athletic, prone to be late and 'spacey'.

Characteristics of the balanced brain learner: Between left and right a combination, a nice balance of the two extremes. Since no one hemisphere dominates, you may never reach full potential of talents characteristic of the extremes.

3.2.4. Effect of the Brain Compatible Classroom and Learning on Academic Achievement in the Foreign Language (English) Course

The arithmetic means and the standard deviations of the groups' pre-test scores in the academic achievement test, and the number of the subjects in the groups are given in Table 3.1.

Table 3.1. The Result of the Independent Samples t Test according to the Groups' Pre-test Scores in the Scale of Academic Achievement

N	$\bar{X}$	Sd	F	t	P
30	33,7667	21,9728	0,414	1,868	0,06
30	23,8333	19,1078		1,868	0,06

In order to check if there is a statistically significant difference in the academic achievement of the groups' pre-tests the Independent Sample t Test has been used. When the figures are examined in Table 3.1., it is seen that the difference between the arithmetic means of the groups' pre-test scores in the academic achievement test is not statistically significant ($P > 0,05$). Therefore, the groups can be said to be equal in terms of academic achievement in English before the practical training.

In order to find out whether there is a significant difference between the arithmetic means of the groups' post-test scores in the academic achievement test, the arithmetic means and the standard deviations of the groups' post-test scores in the academic achievement test, and the number of the subjects in the groups are given in Table 3.2.

Table 3.2. The Result of the Paired Sample Statistics of the Independent Samples t Test according to the Groups' Pre-test and Post-test Scores in the Scale of Academic Achievement

	N	$\bar{X}$	S	Sd	t	P
Experimental-Pre&	30	33,7667	21,97284	29	-12,501	0,000
Experimental-Post	30	86,6333	8,91525			
Control-Pre&	30	23,8333	19,10783	29	-10,680	0,000
Control-Post	30	67,9333	12,01991			

In order to check if there is a statistically significant difference in the academic achievement of the groups' pre-tests and post-tests the Independent Sample t test has been used. When the figures are examined in Table 3.2. there is a meaningful difference in comparison of both the experimental groups' pre-test and post-test scores and the control groups' pre-test and post-test scores ($P < 0,001$). Also the scores of the experimental groups' post-test show that the scores are close to each other (in the pre-test the $S = 21,97284$ and the $S = 8,91525$ in the post-test).

In Table 3.3. the comparison of the experimental groups' pre-test scores and the control groups' pre-test scores, and also the experimental groups' post-test scores and the control groups' post-test scores are given to show if there is a meaningful difference.

Table 3.3. The Result of the Paired Sample Statistics of the Independent Samples t Test according to the Experimental and Control Groups' Pre-test and Post-test Scores in the Scale of Academic Achievement

	N	$\bar{X}$	S	Sd	t	P
Experimental-Post	30	86,6333	8,91525	29	7,325	0,000
&Control-Post	30	67,9333	12,01991			
Experimental-Pre&	30	33,7667	21,97284	29	2,045	0,050
Control-Pre	30	23,8333	19,10783			

In order to check if there is a statistically significant difference in the academic achievement of the groups' pre-tests and post-tests the Independent Sample t test has been used. When the figures are examined in Table 3.3. it is obvious that there is a meaningful difference in the post-tests of the experimental and control groups' scores (in the level of $P < 0,001$). There isn't a meaningful difference in the pre-test scores of the experimental and control group ($P < 0,05$).

3.2.5. Effect of the Brain Compatible Classroom and Learning on Motivation in the Foreign Language (English) Course

The arithmetic means and the standard deviations of the groups' pre-test scores in the motivation test, and the number of the subjects in the groups are given in Table 3.4..

Table 3.4. The Result of the Independent Samples t Test according to the Groups' Pre-test Scores in the Scale of Motivation

N	$\bar{X}$	Sd	F	t	P
30	3,0000	0,8305	0,431	-0,902	0,37
30	3,2000	0,8867		-0,902	0,37

In order to check if there is a statistically significant difference in the motivation of the groups' pre-tests the Independent Sample t test has been used. As it can be seen in Table 3.4., the difference between the arithmetic means of the groups' pre-test scores in the motivation test is not statistically significant ($P > 0,05$).

In the ANOVA test meaningful differences were not seen between the groups ($P = 0,96$). The ANOVA test also put forth that there wasn't a meaningful difference between the groups' age groups and motivation. ($P = 0,97$). In the ANOVA test a meaningful difference was not seen between the experimental group' and the control group's motivation. ($P = 0,37$).

Therefore, the groups can be said to be equal in terms of motivation in learning English before the practical training

In order to find out whether there is a significant difference between the arithmetic means of the groups' post-test scores in the motivation test, the arithmetic means and the standard deviations of the groups' post-test scores in the motivation test, and the number of the subjects in the groups are given in Table 3.5.

Table 3.5. The Result of the Paired Sample Statistics of the Independent Samples t Test according to the Experimental and Control Groups' Pre-test and Post-test Scores in the Scale of Motivation

	N	$\bar{X}$	S	Sd	t	P
Experimental-Pre& Experimental-Post	30 30	3,0000 3,7667	0,83045 0,43018	29	-5,769	0.007
Control-Pre& Control-Post	30 30	3,2000 ^a 3,2000 ^a	0,88668 0,88668			
Experimental-Pre& Control-Pre	30 30	3,0000 3,2000	0,83045 0,88668	29	-0,924	0.806
Experimental-Post &Control-Post	30 30	3,7667 3,2000	0,43018 0,88668	29	3,195	0.850

As it can be seen in Table 3.5. correlation and the t test could not be computed for the comparison of the control group's pre and post tests because the results were the same. These results were identified as the following:

1. Meaningful difference was identified between the pre and post tests of the experimental group's scores (in the level of $P=0,001$).
2. There was not a meaningful difference between the pre-tests of the experimental group's and control group's scores.

3. Meaningful difference was identified between the post-tests of the experimental and control groups' scores (in the level of $P=0,01$).

3.2.6. Effect of the Brain Compatible Classroom and Learning on Attitudes in the Foreign Language (English) Course

The arithmetic means and the standard deviations of the groups' pre-test scores in the motivation test, and the number of the subjects in the groups are given in Table 3.6.

Table 3.6. The Result of the Independent Samples t Test according to the Groups' Pre-test Scores in the Scale of Attitudes

N	$\bar{X}$	Sd	F	t	P
30	3,5667	0,5040	3,639	-1,537	0,13
30	3,7667	0,5040		-1,537	0,13

In order to check if there is a statistically significant difference in the attitudes of the groups' pre-tests the Independent Sample t test has been used. As it can be seen in Table 3.6., the difference between the arithmetic means of the groups' pre-test scores in the attitudes test is not statistically significant ($P>0,05$). Therefore, the groups can be said to be equal in terms of attitudes towards learning English before the practical training.

In the ANOVA test a meaningful difference wasn't seen between the attitude and the age of the groups.

Table 3.7. The Result of the Paired Sample Statistics of the Test according to the Experimental and Control Groups' Pre-test and Post-test Scores in the Scale of Attitude

	N	$\bar{X}$	S	Sd	P
Control-Pre& Control-Post	30	3,7667	0,50401	29	0,000
Experimental-Pre& Experimental-Post	30	3,5667	0,50401	29	0,038
Experimental-Pre& Control-Pre	30	3,5667	0,50401	29	0,981
Experimental-Post &Control-Post	30	3,9000	0,30513	29	0,463

To identify if there is a significant difference the Independent Sample t test was done and it is shown in Table 3.8.

Table 3.8. The Result of the Paired Sample Statistics of the Independent Samples t Test according to the Experimental and Control Groups' Pre-test and Post-test Scores in the Scale of Attitude

	N	$\bar{X}$	S	Sd	t	P
Control-Pre& Control-Post	30	0,2000	0,40684	29	2,693	0,012
Experimental-Pre& Experimental-Post	30	-0,3333	0,47946	29	-3,808	0,001
Experimental-Pre& Control-Pre	30	-0,2000	0,71438	29	-1,533	0,136
Experimental-Post &Control-Post	30	0,3333	0,60648	29	3,010	0,005

As it can be seen in Table 3.8. these results were identified:

1. There is a meaningful difference in the pre and post test of the control groups' scores (in the level of $P=0.05$).
2. There is a meaningful difference between the pre and post test of the experimental groups' scores (in the level of $P=0.01$).
3. Meaningful difference was not seen between the pre-tests of the experimental and control groups' scores.
4. There is a meaningful difference between the post-tests of the experimental and control groups' scores (in the level of $P=0.01$).

3.3. Findings

In the analysis of the data regarding the variables examined in the research, the following findings have been obtained. A significant difference has been observed between the arithmetic means of the groups's post-test scores in the academic achievement test in favour of the experimental group. This finding shows that teaching and learning in a more brain compatible classroom is more effective than learning and teaching in a traditional classroom. A significant difference has been noted in the arithmetic means of the groups's post-test scores in the motivation test in the favour of the experimental group. This result shows that student's motivation level is increased in a learning environment which is more brain compatible than the traditional classroom. A significant difference has been noted in the arithmetic means of the groups's post-test scores in the attitude test in the favour of the experimental group. This finding indicates that students like to be taught in a more compatible classroom and think that they will be more successful in such a learning environment. As the findings indicate the hypothesis has been supported. Learning English in a more brain compatible classroom is more effective than learning it in a traditional classroom.

CHAPTER 4

CONCLUSION

This study aimed to reveal whether a classical classroom and classical teaching methods are more effective or a classroom and teaching methods more compatible to the brain are more effective.

An experimental group and a control group were formed for the study in the Department of Primary School Education, Kastamonu Education Faculty. Both of the groups were formed of thirty students.

This study was done in the Foreign Language (English) course which the first year students take compulsorily. The course book that was followed was Headway Elementary and its workbook. The study was done for six weeks. The experimental group attended the courses in a classroom prepared to be more comfortable and had different kinds of technical equipment for use which aimed to be more brain compatible. Before the course an inventory to identify the student's intelligences, learning styles and a brain dominance was applied. These inventories helped the students to identify their own strengths and focus according to them. The activities presented to the experimental group were adopted according to the levels, needs and interests of the students. Music that fosters the phase of the brain with the advise of Veron (quoted by Swanwick, 1998:23) and Jensen (2003:1-3) was played while and during the training and the activities to the experimental group. Also every subject to be taught was taught with the focus on the learning styles as a whole, the intelligences and they were acted out physically. The control group received no special training but continued their normal programme. The same person gave the training.

At the beginning of the training week a pre-test of academic achievement, motivation, and attitude was administered. The academic achievement test has the

Cronbach's alpha value of 0,82. The pre-tests were administered to both groups to gather baseline data. The experimental group then attended the training sessions in the classroom prepared to be more brain compatible than the control group's traditional classroom.

The academic achievement test was applied to test the groups' academic level before and after the training and aimed to find out if there was a significant difference between the scores. The pre-test of the academic achievement scores were valued and it identifies that there is not a statistical difference in the groups before the training was applied ($P > 0,05$). Also the comparison of the pre and post-test of the experimental and control group showed that there is a meaningful difference in both groups. The standard deviation of the experimental group showed that the scores of the post-test were close and most of the students scored in the same score levels (Pre-test $S = 21,97284$ and Post-test $S = 8,91525$). The comparison of the pre-tests of the experimental and control group showed that there wasn't a meaningful difference in the groups and the groups were equal in the means of the pre-test ($P < 0,05$). The comparison between the post-tests of the experimental and control group showed that there is a meaningful difference in favour of the experimental group ($P < 0,001$). These findings support the hypothesis that the classroom and teaching which is more brain compatible than the traditional classroom is more effective. The results of the experimental group showed better scores than the control group in the academic achievement dimension.

The motivation test was applied to both of the groups as a pre-test before the training and post-test after the training. The aim was to identify if there was a significant difference in the state of motivation in the experimental and control groups before and after the training. In the pre-test of motivation that was applied to the experimental and control group, difference between the arithmetic means of the groups' scores aren't statistically significant ($P > 0,05$). Also meaningful difference were not seen in the ANOVA test ($P = 0,96$). ANOVA also shows that no meaningful difference was seen in the age groups and motivation ($P = 0,97$). Again in the ANOVA, pre-test scores of the experimental and control groups' motivation showed

no meaningful difference ($P=0,37$). These findings show us that the groups' motivation level were equal before the practical training. In the comparison of the pre-test and post-test of the experimental group's scores meaningful difference were identified (in the level of $P=0,001$). The pre-test and post-test scores of the control group could not be computed because they were equally scored in both of the tests. Also meaningful difference was seen in the post-test scores of the experimental and control group in the favour of the experimental group (in the level of $P=0,01$). These findings show us that the motivation of the experimental group showed meaningful difference which means that English taught in a more brain compatible classroom than the traditional classroom increases the motivation of the students. The aim in brain compatible teaching is to increase the intrinsic motivation of the students.

The attitude test was applied as a pre-test before and the post-test was applied after the training to both groups. The aim was to see if there is and will be a significant difference in the students' attitudes in learning English in a traditional and a more brain compatible classroom. Statistical significance was not seen in the arithmetic means of the pre-tests scores of the experimental and control groups attitude test ($P>0,05$). In the ANOVA test no meaningful difference was seen in the attitude and age. In the t-test comparison of the pre-test and post-test of the control group's scores meaningful difference was seen (in the level of $P=0,05$). Meaningful difference was also seen in the pre-test and post-test scores of the experimental group (in the level of $P=0,01$). The comparison of the pre-test scores of the experimental and control group showed no meaningful difference which means that their attitudes were equal before the practical training. When the post-tests of the experimental and control groups' scores were examined meaningful difference was seen in favour of the experimental group (in the level of $P=0,01$). These results show that as in academic achievement and motivation, the attitudes of the students have meaningful difference in favour of the experimental group which identifies that being taught in a more brain compatible classroom increases the attitude of the students positively than the traditional classroom.

As a result of this study, it can be clearly said that even teaching English in the university level, it is useful to create an environment more appropriate to the brain's natural learning process because traditional classrooms are not appropriate for learning English and have negative effect in the learning process. The classroom being formed to change according to the activities, using music in the background and during the activities, using coloured board pens, focusing on all the learning styles and having different activity alternatives which reach to all sort of the intelligences makes learning more easy and enjoying. Lowering the stress and the threat of the classroom also has a very effective place in the learning process. It can be concluded that a learning environment more compatible to the brain's natural learning process increases the level of the learning process in all dimensions.

In conclusion, it was felt that the study might have been more successful with a smaller group of subjects and a longer period of time. Furthermore, a classroom just for teaching English where the technical equipments and the atmosphere which could be more adaptable to English teaching could affect the learning phase more positively.

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APPENDICES

APPENDIX 1 THE INTELLIGENCE INVENTORY

Sorulara Evet diyorsanız boşluğa E harfini, Hayır diyorsanız H harfini yazınız.

1. SÖZEL-DİLSEL ZEKA

1. Kitap okumayı çok seviyorum.
2. Bulmaca, parola, boşluk doldurma gibi kelime oyunlarını çok severim.....
3. İngilizce, sosyal bilimler ve tarih benim için matematik ve fenden daha kolaydır.
4. Bir yolda giderken yoldaki manzaradan ziyade yol işaretlerine dikkat ederim.
5. Yeni öğrendiğim bir kelimeyi konuşurken yada tartışırken kullanmayı severim.
6. Yazmayı severim ve düşüncelerimi yazmayı severim.
7. Hikaye veya fıkra anlatmaya bayılırım.
8. İsim, yer, ve tarihleri kolayca hatırlarım.
9. Çok iyi bir kelime hazinem var.
10. Kitaplarım benim en kıymetli hazinemdir.

Toplam Hayır (H): Toplam Evet (E):.....

2. MANTIKSAL-MATEMATİKSEL ZEKA

1. Sayılarla aram iyidir hatta kafamdan kolayca hesap yapabilirim.
2. Matematik ve fen en sevdiğim derslerdir.
3. Bilimdeki gelişmelere çok meraklıyım.
4. Her şeyin mantıksal bir ilişkisi olduğuna inanırım.
5. Bir şeyin nasıl çalıştığı ile ilgili sorular sorarım.
6. Satranç, dama, ve farklı strateji oyunlarını severim.
7. Her şeyin sebep-sonuç ilişkisi içerisinde olduğuna inanırım.
8. “Zaman ne zaman başladı?” gibi bilimsel ve felsefi sorulara bayılırım.
9. Tanıdıklarım bilgisayar hafızasına sahip olduğumu söylerler.
10. Mutfakta, banyoda, oturduğum sırada nesneleri kategoriye yada şablona koyarım.

Toplam Hayır (H): Toplam Evet (E):.....

3. BEDENSEL-KİNESTETİK ZEKA

1. Uzun biri süre yerimde duramıyorum.
2. Bir spor karşılaşmasını seyretmektense oynamayı tercih ederim.
3. Biriyle konuşurken vücudumu ve el hareketlerini kullanırım.

4. Başkalarını kolayca taklit ederim.
5. Bir şeyi parçalarına ayırım sonra tekrar bir araya getirmeyi severim.
6. Her zaman hareket etmeyi severim. koşmak, yürümek, zıplamak, spor gibi.
7. Ellerimi kullanmayı severim:örneğin dikiş dikmek, tamirat yapmak, bir şeyi kurmak.
8. Kendimi ifade ederken yüz ifademi kullanırım.
9. Bir spor dalı veya aktiviteye dahil olmayı severim.
10. Bir konu hakkında fikirler, çözüm önerileri, veya sonuçlar uzun bir koşuya yada yürüyüşe çıktığımda aklıma gelir.

Toplam Hayır (H): Toplam Evet (E):.....

4. GÖRSEL-UZAYSAL ZEKA

1. Gözlerimi kapadığımda bazı şeyleri daha açık görebiliyorum.
2. Yüzleri isimlerden daha iyi hatırlarım.
3. Kitap okuduğumda, hikayeyi kafamda canlandırıyorum.
4. Kelimelerden ziyade harita, şekil yada grafiklerle anlatılmasını isterim.
5. Şekil çizmekte başarılıyım.
6. Film, resim yada başka görsel nesnelerle daha iyi anlarım.
7. Bilgisayarda yada kağıda şekil çizmeyi severim.
8. Tatilde gittiğim yerleri detayı ile hatırlarım.
9. Renklere karşı genellikle duyarlıyım.
10. Geceleri genelde yaşıyormuş gibi rüyalar görürüm.

Toplam Hayır (H): Toplam Evet (E):.....

5. MÜZİKSEL-RİTMİK ZEKA

1. Eğer müzik olmasaydı hayat çok zevksiz olurdu.
2. Bir şarkıyı bir yada iki kez duyayım ezbere söyleyebilirim.
3. Farklı ses yada tonları kolayca ayırt edebilirim.
4. Ritimleri kolayca hatırlarım.
5. Bir müzik aletini çalabilirim/çalıyorum.
6. Gürültü, yağmur, trafik, vb. gürültülere karşı hassasım.
7. Şarkı söylemeyi severim, kendi kendime şarkı söylemeyi severim.
8. Sahip olduğum en önemli şeyler kasetlerim, CD'lerim ve MP3'lerimdir.
9. Birçok şarkı ve türkünün melodisini bilirim.
10. Ders çalışırken, bir işle uğraşırken yada bir şeyi öğrenirken şarkı söyler, ritim tutar yada bir yere vurarak ses çıkartmayı severim.

Toplam Hayır (H): Toplam Evet (E):.....

6. SOSYAL ZEKA

1. Çevremdeki insanlar genellikle bana danışmaya gelirler.

2. Bireysel sporlardan ziyade takım sporlarından hoşlanırım.
3. Bir sorunla karşılaşınca kendim çözmekten ziyade yardım isterim.
4. İşim yada çevremle ilgili sosyal aktivitelere katılmayı severim.
5. Akşamları evde oturmaktansa dışarıda sosyal aktivitelere katılmayı severim.
6. Başkalarına bir şeyler öğretmekten hoşlanırım.
7. Kolayca arkadaş kurarım, birçok arkadaşım ve tanıdığım var.
8. Başkalarının bakış açısıyla olaylara bakabiliyorum.
9. Başkalarıyla fikir alış verişinde bulunurum.
10. Kalabalıkta kendimi rahat hissederim.

Toplam Hayır (H): Toplam Evet (E):.....

7. İÇSEL ZEKA

1. Devamlı yaptığım bir hobim veya koleksiyonum var.
2. Kendi zayıflıklarım ve güçlerimin farkındayım.
3. Bazen kendi kendimle konuşurum.
4. Kendime zaman ayırırım ve kendimle baş başa olmayı seviyorum.
5. Başkaları ne düşünürse düşünsün savunduğum şeylerin sonuna kadar arkasındayım.
6. Başarılarımdan ve hatalarımdan ders alırım.
7. Kendi bağımsızlığım çok önemlidir ve hiç ödün vermem.
8. Devamlı hayattan ne istediğimi ve neyi başarmak istediğimi düşünürüm.
9. Özel hayatımla ilgili bilgileri bir deftere yada günlüğe tutarım.
10. Geceleri bir partiye gitmektense evde geçirmeyi tercih ederim.

Toplam Hayır (H): Toplam Evet (E):.....

8. DOĞACI ZEKA

1. Hayvanları ve bitkileri insanlardan daha çok seviyorum.
2. Hayvanları ve bitkileri kolayca sınıflandırabiliyorum.
3. Çevremdeki doğayı anlıyor ve ona saygı duyuyorum.
4. Hayvanlara ve onların davranışlarına hayranım.
5. Çevrem ve çevremde olan değişikliklerin kolayca farkında olurum.
6. Doğaya ait şeyleri toplamayı severim: örneğin taş, fosil, kelebek, tüy, kabuk, v.b.
7. Kamp yapmak, balık tutmak, yada doğayla iç içe olabileceğim aktiviteleri severim.
8. Doğa yada hayvanlarla alakalı hikaye yada olaylardan hoşlanırım.
9. Biyoloji, Zooloji, botanik, jeoloji, yada astronomi gibi konulardan hoşlanırım.
10. Ormanda kaybolsam yolumu yıldızlara veya güneşe bakarak kolayca bulabilirim.

Toplam Hayır (H): Toplam Evet (E):.....

(Adapted from Silver,H. et al, 2000:102-103; Kaufeldt, 1999:184-186; Uluç İşisag, 2000: 151-156)



APPENDIX 2 THE LEARNING STYLE INVENTORY

Sorulara fazla düşünmeden cevap veriniz.

Size en uygun numaray ı her ifadenin karş ısına yazınız.

4=Her zaman

1=Nadiren

3=Genellikle

0=Hiçbir zaman

2=Bazen

Numara Olarak Yazınız

1. İnsanlarla

- a)yüz yüze görüşmeyi severim -----
 b)telefonla görüşmeyi tercih ederim -----
 c)yürüyüş, spor gibi bir etkinli içinde beraber olmayı tercih ederim. -----

2. Kızgın olduğumda

- a)susar ve içime kapanırım -----
 b)bağırır ve herkesin bilmesini isterim -----
 c)yumruğumu ve dişlerimi sıkarak patlamaya başlarım -----

3. Gözlerimi kapatıp bir şey düşünürken kafamı

- a)dik tutarım -----
 b)sağ veya sola hafifçe yatırırım -----
 c)aşağı doğru önüme eğirim -----

4. Gözlerimi kapatıp bir şeyi hatırlarken

- a)görürüm ve tüm detayları hatırlar -----
 b)sesleri ve konuşmaları hatırlarım -----
 c)o andaki hislerimi;kızgınlık, üzüntü,sevinç, mutluluk, v.b., hatırlarım -----

5. Hafızanız nasıl?

- a)isimleri unutsam da yüzleri unutmam -----
 b)isim, tarih, sayı ve numaraları hatırlarım -----
 c)uygulayarak dahil olduğum olayları daha iyi hatırlarım -----

6. Evdeki odam

- a)düzenli ve tertiplidir -----
 b)teyp veya müzik setime göre düzenlidir -----
 c)rahatlığ ıma göre ayarlıdır -----

7. Boş zamanlarımda

- a)televizyon seyrederek, kitap okurum -----
 b)müzik yada radyo dinlerim -----
 c)yürür, spor yaparım yada fiziksel bir etkinlik ile uğraş ırım -----

8. Sohbet ederken
- a)çok uzun süre konuşmayı ve dinlemeyi sevmiyorum -----
 - b)dinlemeyi severim ve konuşmak için fırsat kollarım -----
 - c)ellerimi, kollarımı, ve yüz ifadelerimi çok kullanırım -----
9. Oturup beklemek zorunda olduğum durumlarda
- a)etrafa bakar, seyredirim -----
 - b) birileriyle yada kendimle konuşurum -----
 - c)yerimde duramam. tırnaklarımı yerim -----
10. Bir şey okurken
- a)tasvir bölümlerini, hayalimde canlandırabileceğim sahneleri severim -----
 - b)diyaloglardan hoşlanır, onların konuşmalarını duyar gibi hissederim -----
 - c)hareketli bölümleri sevmem yada kitabı hiç okumam -----
11. Ne tür kıyafetleri seversiniz?
- a)renkleri güzel ve çizgileri olanları -----
 - b)pek fark etmez -----
 - c)rahat edeceğim ve spor yapabileceğim bol olanları -----
12. Konuşurken
- a)hızlı ve yüksek sesle konuşurum -----
 - b)ritmik konuşurum, kendimle konuşmayı severim -----
 - c)sessiz ve yavaş konuşurum -----

Not: Şimdi a – b – c- şıklarına verdiğiniz rakamları toplayıp aşağıya yazınız.

A:..... (Görsel yönünüzü gösterir)
 B:..... (İşitsel yönünüzü gösterir)
 C:..... (Kinestetik-Hareket yönünüzü gösterir)

(Adapted from Revell and Norman, 1999:29-30)

APPENDIX 3 THE BRAIN DOMINANCE INVENTORY

Aşağıdaki sorulara vereceğiniz cevabı yuvarlak içine alınız. İyiye düşündükten sonra size en uygun olan seçeneği işaretleyiniz. Sadece birini işaretleyiniz. Kesin doğru cevap yoktur.

1. A. Yeni bir işle uğraşırken kendi başıma sonucu bulmayı tercih ederim.
B. Yeni bir işle uğraşırken sonucu bulabilmem için birinin en uygun yöntemi söylemesini isterim.
2. A. Kendi planlarımı kendim yaparım.
B. Kendime uygun olan tüm planları uygulayabilirim.
3. A. Çok esnek bir insanım ve nerede ne yapacağımı kimse tahmin edemez.
B. Sabit fikirli ve tutarlıyım. Fikirlerimi sonuna kadar savunurum.
4. A. Her eşyamanın yeri bellidir.
B. Eşyalarımın yerini yaptığım işe göre belirlerim.
5. A. Yapacağım işleri genelde zamana yayarım.
B. Yapacağım işler her nedense son dakikada yaparım.
6. A. Haklı olduğumda sonuna kadar savunurum çünkü güçlü sebeplerim vardır.
B. Sebep olmasa da haklı olduğuma inandığımda sonuna kadar savunurum.
7. A. Hayatımda mutlaka çeşitlilikler ve farklılıklar olmalı.
B. Hayatımın düzgün ve planlı olmasını isterim.
8. A. Yeni bir durumla karşılaşınca çözüm için bazen aklıma binlerce fikir gelir.
B. Yeni bir durumla karşılaşınca çözüm için bazen aklıma hiçbir fikir gelmez
9. A. Önce fazla önemi olmayan konuları bitirir, önemli olanları ondan sonra yaparım.
B. Önce önemli konuları halleder, sonra fazla önemli olmayanları hallederim.
10. A. Önemli bir karar verirken mantığımla hareket ederim.
B. Önemli bir karar verirken sezgilerime güvenirim ve ona göre hareket ederim.
11. A. İşlerimi zamana göre planlarım.
B. İşlerimi hallederken zamanı pek düşünmem.
12. A. Genelde çok disiplinli hareket ederim.
B. Genelde duygularıma göre hareket ederim.

13. A. Bir işi organize ettiğimde birçok kişi nasıl yaptığımı anlayamaz.
B. Birçok kişi işleri çok güzel organize ettiğimi söyler.
14. A. Yeni fikirlere başkalarına göre daha açığım.
B. Yeni fikirleri başkalarından daha fazla sorgularım.
15. A. Düşünürken genelde resmederek düşünürüm.
B. Düşünürken genelde kelimelerle düşünürüm.
16. A. Bir problemi çözerken en uygun yöntemi bulmaya çalışırım.
B. Bir problemi çözerken birçok yöntemle sonuca gitmeye çalışırım.
17. A. Genelde bir sonra olacak olayı analiz ederim.
B. Genelde bir sonra olacak olayı sezerim.
18. A. Yaptığım işle ilgili hayal kurmam, kuramam.
B. Yaptığım hemen hemen her işle ilgili hayaller kurarım.
19. A. Başlayıp da tamamlayamadığım birçok işle meşgul oldum.
B. Bir işi bitirmeden kesinlikle yeni bir işe başlamam.
20. A. Sonuçlanmış bir problemi yeni yöntemlerle tekrar çözmeye çalışırım.
B. Eğer bir sorun çözümlenmiş ve doğru işliyorsa, üzerinde durmam.
21. A. Risk almak heyecan vericidir.
B. Risk almadan gayet hayatımdan memnunum.

Sonuç elde etme için:

- 1. – 3. – 7. – 8. – 9. – 13. – 14. – 15. – 19. – 20. – 21. sorulara verdiğiniz A cevabını sayınız ve buraya yazınız. A:.....
- 2. – 4. – 5. – 6. – 10. – 11. – 12. – 16. – 17. – 18. sorulara verdiğiniz B cevabını sayınız ve buraya yazınız. B:.....

A ve B cevaplarınızı toplayınız.

A + B = ...

A ve B toplamı beyninizin hangi yarımküresinin daha baskın olduğunu belirler.

A ve B toplamına göre sonuç aşağıdaki gibidir:

- 0-5 Çok baskın bir sol yarımküreye sahipsiniz.**
- 6-8 Orta derecede baskın bir sol yarımküreye sahipsiniz.**
- 9-12 Her iki yarımküre de aynı oranda baskın.**
- 13-15 Orta derecede baskın bir sağ yarımküreye sahipsiniz.**
- 16-21 Çok baskın bir sağ yarımküreye sahipsiniz.**

(Adapted from Sousa, 2001:187-189)



APPENDIX 4 THE ACADEMIC ACHIEVEMENT TEST

Aşağıdaki parçayı okuyun ve sorulara tam cümle halinde cevap veriniz.

Selçuk is a student in an English course. He is a manager in a big company. They expand goods overbroad to different countries. His classmates also need English in their jobs. Berrin has her own textile company. Burak is a shop assistant at the airport. Lale is a public relations specialist. Emre is a computer programmer. Funda has a gift shop in Sultan Ahmet. Their course is in Bakırköy. They all meet there three times a week. Their teacher's name is Lee. He is from England. He is very nice and a very good teacher.

- 1- What is Selçuk's job?
- 2- Where is their course?
- 3- Who is their teacher?
- 4- What are his classmate's names?
- 5- Why do they learn English?

Cümlelerde parantez içerisindeki fiilleri gerekli zamana göre uyarlayarak tekrar yazınız.

- 6- They(leave) home at 7 o'clock every day.
- 7- Tony.....(love) Mary, but she doesn't love him.
- 8- We.....(not-understand) English, but we can speak German.
- 9- My brother.....(study) English and German at school.
- 10- People.....(cry) when they are sad.

Kelimeleri uygun cümlelere yerleştiriniz. Bir kelimeyi bir kez kullanabilirsiniz.

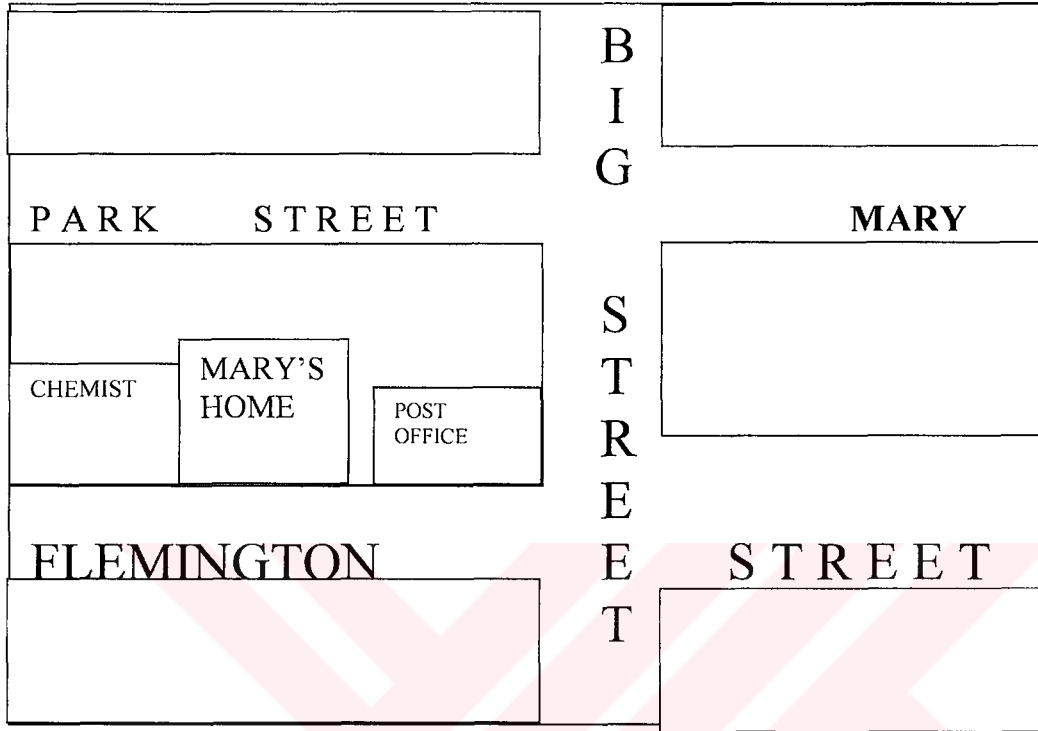
international – stamps – difficult – different – horrible – identity card – subway – centre – winter – boring – fantastic – headquarters – blinds – luxury – neighbour – genius – poetry – wedding

- 11- This child is seven years old but he knows the answers to the university exam questions. He is a
- 12- I use the from Kızılay to Batıkent everyday.
- 13- My is from Kayseri. We drink coffee and watch TV series together.
- 14- People must carry their.....next to them. You never know when you'll need it.
- 15- I want to post this letter but I haven't got any

Boşluklara gerekli Ülke yada Millet isimlerini yazınız.

- 16- Ali is from Turkey. He is a
- 17- They are from..... They are Greek.
- 18- Bush is from America. He is an
- 19- Tony is from He is an Italian.
- 20- Tu Che is from China. He is a.....

Haritaya bakarak Mary'nin evine gitmesine yardımcı olmak için cümleleri doğru sıraya koyunuz.



- 21- a) It is between the Post Office and the Chemist.
 b) Walk along big street.
 c) Go straight ahead.
 d) Take the first turn to the left.
 e) Walk across the street.
 f) Turn right at the corner of the Post Office.

Verilen İsimlerin ÇOĞUL hallerini yazınız.

- 22- a child = two
 a box = three
 a man = ten
 a person = five

- 23- a leaf = four
 a story = nine
 an apple = two
 a tooth = thirty two

Verilen Soru Eklerini uygun yerlere yerleştiriniz.

Who – Where – When – Why – How Much – How Many – How – Whose – Which – What

24- street do you live in?

25- does your father come home?

- 26- brothers and sisters do you have?
 27- is your teacher's name?
 28- do your parents live?
 29- does your mother work?
 30- knows the answer to this question?

Cümlelerdeki boşluklara uygun olan kelime yada kelimeleri koyunuz.

- 31- My name Paul.
 32- I from London.
 33- John and Jane from Manchester.
 34- This is Kurt. He a student.
 35- money have you got?
 36- she married? No, she isn't.
 37- is the boy next to Marry. He's Mike. He's her new boyfriend.

Cümlelerde koyu yazılmış iki kelimeden doğru olanı yuvarlak içine alınız.

- 38- **Whose/Who** dictionary is this? I found it in the class.
 39- What is **her/hers** job? She's a doctor.
 40- George is **mine/my** pen friend. I'm going to **his/him** country in March and he's going to come to **mine/my** in August.
 41- We all like Michael. He is **our/ours** best friend.

Cümlelerdeki boşluklara uygun olan iyelik zarfını yazınız. Örnek "my".

- 42- The Browns are going for a holiday. They're taking dog with them.
 too.
 43- Hugh and James like Madonna, but they didn't like new cassette.
 44- I want to buy a car. It has to be a BMW and color must be red.
 45- He forgot mobile phone, but I gave it back to him.

Boşluklara a, an, the yada gerekmiyorsa x işareti koyunuz.

- 46- Tokyo is Japanese City.
 47- It was difficult exam.
 48- He likes to drive at hundred miles hour.
 49- Bosphorus Bridge is one of longest bridge in the world.
 50- Jam will be on television tonight.

Cümlelerdeki boşluklara uygun yardımcı fiilleri koyunuz.

- 51- How you go to school John? I go by bus.
 52- Where Martha work? She works in a bank.
 53- When they go home? At 6:00.

Karışık verilen cümleleri yeniden yazarak doğru sıraya koyunuz.

- 54- play tennis you every week? / Yes I do.
 55- the play take place when? / It's on 23rd of May.

56- who she want to work with? / She wants to work with her friend Hanna.

57- how this machine start ? / Just press the start button.

Cümlelerdeki boşluklara DOES, IS, yada HAS koyun.

58- He 3 brothers and 2 sisters.

59- Where he live?

60- she have an exam tomorrow?

61- Veli an Economics teacher.

Aşağıdaki kelimeleri uygun gruba yazınız.

England – book – hamburger – football – bowling – August – dictionary – crisps – June – glue – Argentina – China – boxing – rubber – March – apples – swimming – cake – pencil – November – surfing – Tunisia – December – chocolate - Germany

62- Countries:

63- Months:

64- Food:

65- Sports:

66- School things:

Aşağıdaki cümlelere kısa cevap veriniz.

67- Do you know how to drive?

68- Does ice melt at 0°?

69- Do kangaroos live in Australia?

70- Does a vegetarian live on vegetables?

Aşağıda verilen saatleri tam cümle halinde yazılı olarak ifade ediniz.

71- 10:00

72- 03:15

73- 05:30

74- 17:45

Cümlelerdeki boşluklara uygun kelimeyi koyunuz.

75- - you lend me some money?

- Of course.?

- \$100.

- Oh! That's too much. I can give only half of it.

- Ok I will find the rest from other people.

Doğru şıkkı yuvarlak içine alınız.

76- a mouse in the kitchen.

a) There is b) It's c) That is d) This is

77- Lock the door of the class. I can't. students in the class.

a) This is b) They are c) Those are d) There are

Cümledeki boşluklara uygun preposition koyunuz.

- 78- I'm going school.
 79- They're spending the week London
 80- She was born 17 of March.
 81- Winter starts December.
 82- They have to go to the museum Tuesday.

Cümledeki boşluklara some yada any koyunuz.

- 83- Can I serve you fruits juice?
 84- Have got exams next week?
 85- There were films on TV night.
 86- 71- She doesn't want money from you.
 87- They never visited museums.

Cümledeki boşluklara is, are, was yada were koyunuz.

- 88- . Did john work here before? As I remember he..... an engineer.
 89- John..... always late to school.
 90- They..... very happy before 11 September. but the awful event made them sad.
 91- Once she..... an artist but now everyone has forgotten her.
 92- We..... always waiting for a raise in our salary.

Cümledeki boşluklara can, could, couldn't, yada was koyunuz.

- 93- The door..... open and I saw everything.
 94- They didn't entered the show. so I..... see them.
 95- I..... prepare for the exams, so I got a bad mark.
 96- She..... swim but now she learned it.
 97- I..... run 100 meters in 12 seconds when I was young.
 98- you play the guitar?

99- Aşağıdaki kelimeleri eşleştirin

- | | |
|-------------------|-------------------|
| a- go -..... | 1- your coat |
| b- sing-..... | 2- a picture |
| c- take off-..... | 3- a song |
| d- look up-..... | 4- shopping |
| e- draw-..... | 5- the dictionary |

100- Aşağıdaki zıt kelimeleri eşleştirin.

- | | |
|-------------------|--------------|
| a- difficult..... | 1- sad |
| b- happy..... | 2- beautiful |
| c- cheap..... | 3- easy |
| d- ugly..... | 4- silent |
| e- noisy..... | 5- expensive |

c) Kısmen katılıyorum

d) Hiç katılmıyorum

10) İngilizce'nin uluslar arası bir dil olması ve ileriki yaşantımda bana ekonomik ve sosyal faydalar getireceğini düşündüğümden dolayı İngilizce'yi isteyerek ve severek öğreniyorum.

a) Tamamen katılıyorum

b) Oldukça katılıyorum

c) Kısmen katılıyorum

d) Hiç katılmıyorum



APPENDIX 6 THE SCALE OF DEVELOPING POSITIVE ATTITUDE TOWARDS LEARNING ENGLISH IN A MORE BRAIN COMPATIBLE CLASSROOM

Bu anket, şu anda almakta olduğunuz yabancı dil (İngilizce) dersinde daha etkili bir dil öğrenimini sağlamak için öğretim ve öğrenim açısından sınıfta yapılabilecek değişiklikler konusunda görüşlerinizi almak için hazırlanmıştır.

Aşağıdaki sorularda sizin için en uygun olan seçeneği yuvarlak içine alınız.

1) Birçoğunuz ortaokul ve lisede değişik nedenlerden dolayı yeterli düzeyde İngilizce bilgisi edinemediniz. Bunun en büyük nedeni sınıf ortamının ve uygulanan aktivitelerin İngilizce öğrenimine uygun olmamasından dolayıdır.

- | | |
|------------------------|------------------------|
| a) Tamamen katılıyorum | b) Oldukça katılıyorum |
| c) Kısmen katılıyorum | d) Hiç katılmıyorum |

2) Bu derste geleneksel bir öğrenim ve öğretim yönteminden ziyade İngilizce'yi daha etkili öğrenebileceğim ve beklentilerime göre düzenlenmiş bir öğrenme ortamının hazırlanmasını olumlu karşılarım.

- | | |
|------------------------|------------------------|
| a) Tamamen katılıyorum | b) Oldukça katılıyorum |
| c) Kısmen katılıyorum | d) Hiç katılmıyorum |

3) İngilizce'yi öğrenirken farklı zeka türüne ve farklı öğrenme stillerine sahip olabilirsiniz. Farklı zeka türüne ve öğrenme stillerinize uygun öğrenim materyallerinin; örneğin görsel ve işitsel, kullanılması öğrenmemizi kolaylaştırır ve hızlandırır.

- | | |
|------------------------|------------------------|
| a) Tamamen katılıyorum | b) Oldukça katılıyorum |
| c) Kısmen katılıyorum | d) Hiç katılmıyorum |

4) Bazılarınız diğer alanlardan ziyade, örneğin dil, müzik, kişiler arası ilişkiler gibi alanlarda yetenekli olabilirsiniz, bu farklı yetenek alanlarınızı yansıtacak bir sınıf ortamının olmasını olumlu karşılarım.

- | | |
|------------------------|------------------------|
| a) Tamamen katılıyorum | b) Oldukça katılıyorum |
| c) Kısmen katılıyorum | d) Hiç katılmıyorum |

5) Sınıf ortamının psikolojik yönden rahat olması ve sınıfta öğrenme bakımından rahat hareket edebilmem. İngilizce'yi öğrenmemi olumlu etkiler.

- | | |
|------------------------|------------------------|
| a) Tamamen katılıyorum | b) Oldukça katılıyorum |
| c) Kısmen katılıyorum | d) Hiç katılmıyorum |

6) İngilizce dersi esnasında sınıf içerisindeki fiziksel ortam. örneğin hava, ışık, sıcaklık ve yiyecek, içecek ihtiyaçlarının karşılanması öğrenmemi olumlu yönde etkiler.

- | | |
|------------------------|------------------------|
| a) Tamamen katılıyorum | b) Oldukça katılıyorum |
|------------------------|------------------------|

- c) Kısmen katılıyorum d) Hiç katılmıyorum

7) Sınıf ortamındaki geleneksel oturma düzeninden ziyade birbirimizle ve öğretmenle etkileşim kurmamızı sağlayacak ve değişik aktivitelere göre düzenlenebilen bir oturma düzeni olmasını tercih ederim.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

8) Sınıfta öğrenme materyali olarak ders kitabına ilaveten İngilizce'yi ders dışında da öğrenmemizi sağlayacak görsel, işitsel, kinestetik (dokunsal) materyallerin bulunmasını tercih ederim.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

9) İngilizce'yi kullanabilmek bakımından bu dilde yazılmış kitap, dergi, gazete, vb. materyallerin olması öğrenmemize çeşitlilik kazandırır.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

10) İngilizce bilmemizin bir ölçütü olarak sınıfta bu dili hazırlanan değişik ortamlarda konuşabileceğimiz aktivitelerin bulunmasını olumlu karşılarım.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

11) Derste birbirimize görüş ve düşüncelerimizi ifade etmek, İngilizce öğrenirken birbirimize yardım etmek daha rahat ve kolay etkileşim kurabilmek, dil öğrenirken kendimize güvenimizin artması, kendimizi ve diğer arkadaşlarımızı daha yakından tanımak bakımından grup, eşli ve bireysel çalışmaların yapılması İngilizce öğrenimimiz üzerinde olumlu etki yapacaktır.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

12) Derste İngilizce'yi öğrenirken zorlandığımız konularda yada bilgilenme ihtiyacı duyduğumuz konularda sınıf arkadaşlarımızla ve özellikle ders öğretmeniyle görüşmek ve ondan rahatça yardım almak İngilizce öğrenimimizde olumlu etki yaratır.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

13) Derste bazı konuları geleneksel biçimde öğrenmek yerine, bu konularla ilgili sınıfta drama gibi harekete dayalı etkinlikler yapmamız İngilizce'yi gerçek yaşamdaki gibi kullanabilmemiz bakımından öğrenme ortamını daha zevkli ve eğlenceli hale getirir.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

14) Sınıfta tek öğretici kaynak olarak öğretmeni görmekten ziyade İngilizce’de öğrenmeyi istediğimiz konularda fikrimizi söyleyebilmemiz ve öğretmenin bunu dikkate alarak dersi işlemesi öğrenme isteğimizi artırır.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

15) İngilizce’yi öğrenirken konuları kişisel deneyimlerimle ilişkilendirmem ve öğrendiklerimin gerçek hayatta çok yararlı olacağına inanmam daha etkin bir biçimde öğrenmemi sağlar.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

16) Öğrendiğimiz konuları ezberlemek yerine bunları öğrendiğimiz bağlam, canlandırmalar ve konunun gerektirdiği görsel işitsel canlandırma yönleriyle ilişkilendirerek öğrenmemiz, uzun süreli hafızamızın gelişmesini sağlar.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

17) Sınıf ortamının fiziksel yönden en rahat bir biçimde düzenlenmesi İngilizce öğrenme isteğimizi olumlu yönde etkiler.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

18) Öğrendiğimiz konuları kendi yaşamımıza uyarlayabilmek için sınıfta benzeşim ve belli rolleri canlandırarak, yaparak ve yaşayarak uygulanması İngilizce öğrenimimize olumlu etki eder.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

19) Öğrenilen konuyu öğretmenin hemen gözden geçirmesi yerine konunun yerleşmesi açısından bir süre tanınması İngilizce öğrenimimizde olumlu etki yapar.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

20) İngilizce bilgimin ölçülmesi ve değerlendirmesi tek bir sınava yada öğretmene bağlı kalmamalı, ölçme ve değerlendirme aşaması bir süreç içerisinde kendimin ve arkadaşlarımda katılımıyla yapılmalıdır.

- a) Tamamen katılıyorum b) Oldukça katılıyorum
c) Kısmen katılıyorum d) Hiç katılmıyorum

APPENDIX 7 A SAMPLE LESSON PLAN FOR BRAIN COMPATIBLE LEARNING

PART I

Name of the Course	ENGLISH
Class	I-A
Name of the Unit / Number	NEW HEADWAY-ELEMENTARY UNIT-1
Subject	HELLO EVERYBODY!
Duration	16 OR 21

PART II

Student Benefits / Aim and Objectives		TO INTRODUCE ONESELF
Concepts and Symbols of the Unit/ Behavioral Pattern		PRESENT 'TO BE' – POSSESSIVES – NUMBERS – EVERYDAY OBJECTS – A / AN ARTICLES – PLURAL -S
Learning-Teaching Method and Techniques		COMMUNICATIVE APPROACH
Educational Technologies – Tools, Materials, and Resources *Teacher *Student		Ss.BOOK,TEACHER'S BOOK,WORKBOOK, DICTIONARY, CASSETTE RECORDER,MAP
Learning-Teaching Activities	Verbal-Linguistic	SPEAKING , WRITING COMPOSITION , LISTENING , READING
	Naturalistic	MIM –MEM , ROLE PLAY ,
	Interpersonal	PAIR WORK , GROUP WORK , ROLE- PLAY , REPETITION ,
	Logical-Mathematical	NUMBERS :ADDITION-DIVISION-MINUSING-MULTIPLYING
	Intrapersonal	INDIVIDUAL WORK , SELF- CORRECTION ,
	Visual-Spatial	PICTURES , MAP , REALIA , CLASSROOM OBJECTIVES
	Musical	COMPLETE A SONG
	Bodily-Kinaesthetic	ROLE PLAY ,

PART III

Assessment	QUESTION –ANSWER/ QUIZ/ (Individual. Each other, Portfolio, etc.)
*Assessment on individual learning participation *Assessment on group learning participation	WRITTEN COMPOSITION ON ‘INTRODUCING YOU AND YOUR FAMILY ‘

PART IV

Explanations on the Application of the Plan	%100 PARTICIPATED IN THE CLASSROOM ACTIVITIES
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Before the study began, information on the structure and the function of the brain was given. The students were also informed about the aim and the process of the course.

UNIT 1- HELLO EVERYBODY!

The classroom was established to create a neighbourhood: pictures of houses, gardens, playgrounds, etc..

The title of Unit 1 is ‘Hello everybody !’, and one important aim is that students get to know each other and you, and you, and you get to know them. Obviously students will have relatively little English to use at this stage, but nevertheless a convivial classroom atmosphere can be established through quite basic interchanges. The aim was to establish friendship where students feel themselves that they belong to the class so they start to know each other.

LANGUAGE AIMS:**Grammar – am / is / are**

To focus on the verbal-linguistic intelligences the verb to be is introduced in all persons, singular and plural. The focus is on the positive and questions with question words (where, what, and how).

Because the structure of the language is given music of Latin Gypsy (CD by Marc Antonie), Whistle while you work was played in the background which is to make the students be relaxed and still alert (35-50 BPM).

Possevive adjectives

Also **my**, **your**, **his**, and **her** are introduced in the unit.

Vocabulary

For visual and auditory input a globe, maps, and music from different countries were used to introduce the names of countries which is a part of the work on introductions. In the vocabulary and pronunciation section, the alphabet is introduced and practised. Students look at the dictionary, and everyday objects such as ticket and key. Students are asked to work out the rules for using **a / an** and the formation of regular plurals with **-s**. Students are allowed to work on the rules individually or in pairs as they will. This is done to focus on the students' interpersonal, intrapersonal intelligences. Music was played during this activity (35-50 BPM) (look page 57-59).

Everyday English

To focus on the students' logical-mathematical intelligence numbers 1 – 20 are revised and practised. The situational focus includes practice on exchanging telephone numbers and work on saying hello and goodbye. The students are also asked to write dialogues in pairs or groups introducing eachother and using the numbers as well (for telephone, etc.). This is to focus on the student's verbal-linguistic, logical-mathematical, bodily-kinaesthetic, and interpersonal intelligences.

While the students are introducing eachother lyrics are played in the background (35-50 BPM) (look page 57-59).

Workbook

Nationality adjectives (German, French); the numbers 1-20 are practised.

NOTES ON THE UNIT

Starter

1 Say your own name – I'm Serhan Köse –and point to yourself to make the meaning clear. The students introduce themselves by saying their names – I 'm Ahmet, I 'm Kenan, etc. Encourage students to listen to each other's names and to memorize as many as they can. To gain a good atmosphere play a memory game by pointing to individual students and yourself and getting the group to say just the name, e.g. Serhan! Kenan!

2 To focus on the students verbal-linguistic. and logical-mathematical intelligences check students understand 'alphabetical order 'by putting letters a –g on the board in random order and asking students to re – order them alphabetically. (Don't worry too much if students pronounce the letters wrongly as the alphabet is covered later in the unit.) Check by asking students to put the names in Starter 1 in order.

Ask students to stand up in alphabetical order and say their name.If appropriate: repeat this getting progressively faster each time. When the activity gets faster the music which is 50-70 BPM given in page 57 (in arousal state) is played.

INTRODUCTIONS

Am / is / are, my / your

1 T 1.1 Ask students to read and listen. Play the recording two or three times, repeat as a class first, then practise it in both open (i. E. Students ask and answer the question across the room with the rest of the class listening) and closed pairs (i.e. the whole class working in pairs). This is done to focus on the students visual and auditory styles of the students and their interpersonal and intrapersonal intelligences.

GRAMMAR SPOT To focus on the students' verbal-linguistic intelligence focus attention on the contractions. Ask students to circle the contracted forms in exercise 1.

2 Ask students to complete the conversation. Remind them to use contracted forms.

T 1.2 Play the recording and let students check their answers. If you feel students need more practice, ask them to say the dialogue in open and closed pairs.

Answers and tapescript

A Hello. My **name's** Richard. What's **your** name?

B Kurt.

A **Where** are you from, Kurt?

B I **'m** from Hamburg. Where **are** you from?

A I **' m from** London.

3 This is a mingle activity. Demonstrate the dialogue first in open pairs, and then get students to move around the class and talk to as many people as possible. Don't let this activity go on too long. If you have a large class, it will be impossible for all the students to talk to everyone. Then the students were asked to make dialogues. The students done this exersice in pairs or groups as they willed. When the students completed the conversation, the classroom was arranged according to each groups conversation place whith the equipments in the class (pictures, plants, puppets of animals). This was done to focus on the students' interpersonal, naturalistic, bodily-kinaesthetic, visual-spatial and verbal-linguistic intelligences. By doing so using art activities in the classroom was also aimed.

ADDITIONAL MATERIAL

Workbook Unit 1

Exercise 1-3 These practise What's your name? , Where are you from? I 'm from ..., and I 'm (a) ...

Countries, his / her

For visual focus a world map or a globe would be useful for presenting the names of the countries.

4 Focus attention on the table with the names of the countries. Explain stress and the system of stress marks used in Headway with an example on the board, e.g.

O *

England

You could use L 1 to explain , and you could perhaps take some examples of words with more than one syllable in L 1 (if L1 is stress- timed itself, not syllable-timed) to show how there are stressed and unstressed syllables.

T 1.3 Ask students to read the list of countries as you play the recording. Then they can listen and repeat the second time. With the globe and maps in front of the students practise the countries as a class, then in closed pairs. This is to focus on visual and auditory styles as well as the intrapersonal, visual-spatial, and verbal-linguistic intelligences.

5 Ask students to look at the photographs and read about the people.

GRAMMAR SPOT Focus attention on the contractions. Ask students to circle the contracted forms in the sentences in exercise 5.

Ask students in pairs or groups to write where the people are from. Students are not expected to know how to say Hello! In all the different languages! This is merely a fun way to introduce countries and the third person singular and plural. Some students will know a few, others will know more.

Answers

- 1 This is Richard. He's from England.
- 2 This is Tomoko. She's from Japan.
- 3 This is Lina and Miguel. They're from Brazil.
- 4 This is Anna. She's from Italy.
- 5 This is Irina. She's from Russia.

6 This is Laszlo and Ilona. They're from Hungary.

7 This is Maria. She's from Spain.

8 This is Kurt. He's from Germany.

9 This is Pierre. He's from France.

The students are also asked to act according to the country they introduce. They are asked to show how the people from different countries act. This is aimed to focus on the students' bodily-kinaesthetic, verbal-linguistic, intrapersonal and in some activities musical intelligences. It is also aimed for the students to have fun so a good atmosphere is created in the class.

6 Introduce the questions What's his /her name? and Where's he / she from ? Point to some of the students, ask the questions yourself, and let the students reply. Then drill the questions and correct any mistakes in the use of he / she and his / her carefully. Practise the questions and answers in open pairs.

Ask the students to continue the activity in closed pairs. Monitor and check for correct use of he /she and his / her, and if necessary, drill the language again using the pictures in the book. At the end of the activity, consolidate the positive form by asking students to say His / Her name's ... , He's / She's from ... or They 're from

GRAMMAR SPOT

Ask students to complete the table with am, is, and are. Check the answers.

Answers

I	Am	from England
He She It	Is	
We You They	Are	

Briefly check comprehension of the subject pronouns which are covered.

PRACTICE

Talking about you

- 1 Demonstrate the activity by getting students to ask and answer the same questions in open and / or closed pairs about the other people in the class. Make role cards giving students a new country of origin, or the identity of a famous person whose country of origin the class would know. This practices the vocabulary of the exercise, too. The classroom is designed according to the country they introduce. This activity is done to focus on the students' verbal-linguistic, bodily-kinaesthetic, visual-spatial, musical, interpersonal, intrapersonal and naturalistic (students who introduced African countries) intelligences.
- 2 Ask the students to introduce their partner to the rest of the class. Check for the correct use of he / she and for the correct stress on the names of countries (interpersonal intelligence).

The students played a ball game by throwing the ball to each other. They were asked to tell a country with the end alphabet of the given country. The aim was to focus on verbal-linguistic, interpersonal and bodily-kinaesthetic intelligences.

Listening and pronunciation

- 3 **T 1.4** Play the recording. Ask students to tick the sentence they hear. This is an exercise that tests discrimination, but you can make it productive afterwards by asking students in pairs to practise the pairs of sentences. Pay particular attention to the sounds /ɪ / and / i: /. Verbal-linguistic, visual-spatial and interpersonal intelligences were focused.

Answers and tapescript

1. He's from Spain.
2. What's her name?
3. They're from Brazil.
4. Where's she from?
5. He's a teacher in Italy.

Check it

- 4 Ask students to work individually or in pairs to put am. is. are. his. her. or your into the gaps. Afterwards, you can ask them to make the contractions in numbers 1, 3, and 7. Interpersonal, intrapersonal and verbal-linguistic intelligences were focused.

Answers

- 2 Where **are** you from?
- 3 I **am** from Japan.
- 4 'What's **your** name?' 'My name's Tomoko.'
- 5 Max and Lisa **are** from Chicago.
- 6 This is my teacher. **His** name's Richard.
- 7 Where **is** he from?
- 8 This is my sister. **Her** name's Emma.

Reading and Writing

NOTE The aim of this section is to allow students to see how much English they already know. Let students write about themselves. Then the students were to read what they have written. This is to make the students know each other so they can feel as they are a part of the class and to make interaction between the students.

The verbs have, live, and want appear in their Present Simple form, but you don't need to review this tense at this stage.

5 T 1.5 Ask students to read and listen to the text about Rafael. Make sure students understand married and children. You could ask one or two students to read the text aloud, or in closed pairs, and the students can help each other with pronunciation.

6 Ask students to complete the text about Yasmina. Make sure students understand flat, international, and language.

T 1.6 Play the recording to check. Again, you could practise the text around the class and /I or in closed pairs.

Tapescript and answers

My name's Yasmina Kamal and I am a student. **I'm** 19. I'm not married. I have one **sister** and two brothers. I **live** in a flat in Cairo, Egypt. I **want** to learn English because it's an international **language**.

4 Ask students to write about themselves. After quite a lot of oral class workig. some silent, individual work provides variety and balance. Ask them to read what they have written to the class. Don't worry if there are a lot of pronunciation mistakes. The aim is for students to show what they can do, and to say a little about themselves and their families. Interpersonal, intrapersonal and verbal-linguistic intelligences and interaction between students are focused.

If you have a large class, not all the students will be able to read out what they have written. Collect it in. If you have a smaller class, it can be interesting to record the students. Play the recording back and correct mistakes that are common to the whole class. You can also let the students correct eachother or individual correction is also possible.

ADDITIONAL MATERIAL

Workbook Unit 1

Exercises 4 and 5 Third person is and are , and short and long forms.

Exercises 6 and 7 Possessive adjectives.

Exercises 8 and 9 Countries and nationalities with stress practice.

VOCABULARY AND PRONUNCIATION

SUGGESTION Some students may be quite familiar with the letters of the alphabet, while others may not remember many of them. Whatever your students' knowledge at this stage of the course, remember that they will all need regular practice in the alphabet and spelling. This can easily be integrated into any lesson when teaching new vocabulary (How do you think you spell ... from the sound?), or when reviewing vocabulary (How do you spell ...?). and by the use of spelling games.

If your group cannot remember much of the alphabet, you may want to write it on the board and drill the letters in groups of five before moving on to the song.

T 1.7 Tell the students that they are going to listen to the alphabet in the form of a song. Ask them to join in where they can. Play the recording and note down the letters students get wrong or don't know, paying particular attention to a, j, e, g, i, y, u, w, r, which cause problems for many students. Drill the letters which students found difficult.

Practise the letters as a class and in closed pairs. Listen to the song again and let the students sing it if they want to. It certainly helps them to remember the pronunciation of the alphabet!

T 1.7 The alphabet song

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

This is the English alphabet!

The students were asked to clap while the alphabet song played. Musical, interpersonal, intrapersonal and bodily-kinaesthetic intelligences were focused in this activity.

Pre-teach the question How do you spell ...? And the use of double for spelling (e.g. apple = a, souble p, l, e) .Get students to practise asking the question and spelling in pairs, using their own names or the names of famous people. Do not focus on the use of do to form questions in the Present Simple as in How do you spell ...?

2 Students match the words and pictures. Encourage them to work in pairs and match the words that they recognize first. Then they can use a dictionary to complete the activity. Monitor and check for pronunciation.

Answers and tapescript

A a dictionary

B an orange

C a newspaper

D a stamp

E a bag

F a camera

G an apple

H a letter

I a magazine

J a ticket

K a key

L a postcard

T 1.8 Play the recording and get students to repeat the words as a class and individually. If students have problems with incorrect stress, refer them to the table or help them self-correct. If necessary, drill the words, stopping the recording after each example.

4 Demonstrate the activity by saying the letter of some of the phtographs and asking a student to tell you what the object is and how you spell it. Students continue in closed pairs.

5 Ask students to look at the words and to work out the rule if they don't already know it. In this activity students are asked to mime a job ("What am I" game). The students were grouped in two and one student had to mime a job to his/her group

(The job was given by the teacher). Who guessed the most won the game. All of the eight intelligences were focused with this activity.

Answers

The letters **a, e, i, o, and u** are vowels. **a** goes before word with a consonant. **an** goes before a vowel.

Point out the following sound rules:

-when we pronounce u / ju: /ɪ, we use a, e.g. a university

-when h is silent, we use an, e.g. an hour.

6 Ask students to look at the plural and work out the rules for the formation of plurals.

Answers

Most nouns add **-s**. Nouns ending in a consonant **+y**, take away the **-y** and add **-ies**.

Get students to say the plurals of the other words in exercise 2.

ADDITIONAL MATERIAL

Workbook Unit 1

Exercise 10 and 11 a / an

Exercise 12 Check it

EVERYDAY ENGLISH

Hello and Goodbye

1 Get students to say numbers 1-20 around the class. If necessary, drill the numbers and check for correct stress on numbers 13-19, e.g. * 0

thirteen.

2 T 1.9. Ask students to read and listen to the telephone numbers. Focus attention on the use of double for repeated numbers and the use of 'oh' for 0 rather than zero.

Make sure students realize that each number is read individually in English, unlike some languages where 94 would be read as ninety – four.

3 T 1.10 Tell students they are going to hear six sentences, each of which contains a number. Ask students to write down the numbers they hear. If necessary, pause the recording after each sentence, or play the recording a second time. Check the answers.

Answers and tapescript

- 1 Hello. **01913 786 499**
- 2 My brother has **four** children.
- 3 I have **10** stamps in my bag.
- 4 Hello, extension **4177**.
- 5 I live at number **19**.
- 6 Goodbye . See you at **five**.

Get students to practise the numbers in the sentences.

4 Drill the question and answer. Then get students to ask other people what their phone number is and to write a list. If you have a big group , check a few of the numbers across the class. If you have a small group, you could check the numbers by by writing up the list on the board. Verbal-linguistic, logical-mathematical, bodily-kinaesthetic, visual-spatial, interpersonal, and intrapersonal intelligences were focused.

5 Ask students to write the conversations in the correct order. **T 1.11** Play the recording to check.

Answers and tapescript

- 1 **A** Hello, extension 3442
B Hello. Mary. This is Edward. How are you?
A I 'm fine, thank you. And you?

B I'm OK, thanks.

2 A Goodbye , Marcus.

B Goodbye, Bianca. Have a nice day.

A Thanks, Marcus. See you this evening!

B Yes, at seven in the cinema.

3 A Hello, 270899

B Hi, Flora ! It's me, Leo. How are you?

A Not bad , thanks. And you?

B Very well. How are the children?

A They're fine.

6 Students practise the dialogues in open and then closed pairs. Then ask students to practise again, using their own names and telephone numbers. They also act out the dialogues they have written. Verbal-linguistic, logical-mathematical, bodily-kinaesthetic, and interpersonal intelligences were focused.

Also the students played the "Simon Says" game to focus on the bodily-kinaesthetic intelligence.

In every stage of the course music was played according to the phase of the activity (look page 57-59).