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

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Beyne Daha Uygun Bir Öğrenme Ortamında Üniversite Öğrencilerine İngilizcenin Yabancı Dil Olarak Öğretilmesi

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. Araştırma 2004-2005 akademik yılında Kastamonu Üniversitesi Eğitim Fakültesi İlköğretim Bölümü birinci sınıf öğrencilerinin katılımıyla gerçekleştirilmiştir. Araştırmada model olarak ön-test son-test kontrol gruplu desen kullanılmıştır. Sonra, daha önce oluşturulmuş olan beyne daha uygun bir sınıf ortamında denek grubuna İngilizce öğretilmiştir. Kontrol grubu İngilizceyi geleneksel üniversite sınıfında öğrenmiştir. Altı hafta sonra her iki gruba son test uygulanmıştır. Araştırmanın sonucunda beyne daha uygun öğrenme ortamında İngilizce öğrenen denek grubunun akademik başarı düzeyinin geleneksel sınıfta İngilizce öğrenen kontrol grubundan daha yüksek olduğu ortaya çıkmıştır.

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Introduction

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. 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. Students are separated into groups and placed in grades, from kindergarten all the way through college. Funderstanding (1998, p.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.

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, p.1) argues that the more we understand the brain, the better we'll be able to design instruction to match how it learns best. 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. The current study focuses on the environmental, physical, and the psychological conditions that affect the students' learning besides informing the latest information about the brain.

Literature Review

Brain Cells

Jensen (1998, p.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, p.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. 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, p. 11). 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, p. 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.

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, p. 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, p. 20). The thicker this myelin sheath is the faster it conducts electricity and information.

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 individuals brain with therapy the brain will not lose its function. Sprenger (2002, p. 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. 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. 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.

Chemical Messengers: Behavioural, microscopic, molecular or whatever happens in the brain every action is supported by chemical messengers.

The Cerebrum and Lobes of the Cerebral Cortex

In this part we will 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, p. 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.

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.

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. The parietal lobes 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.

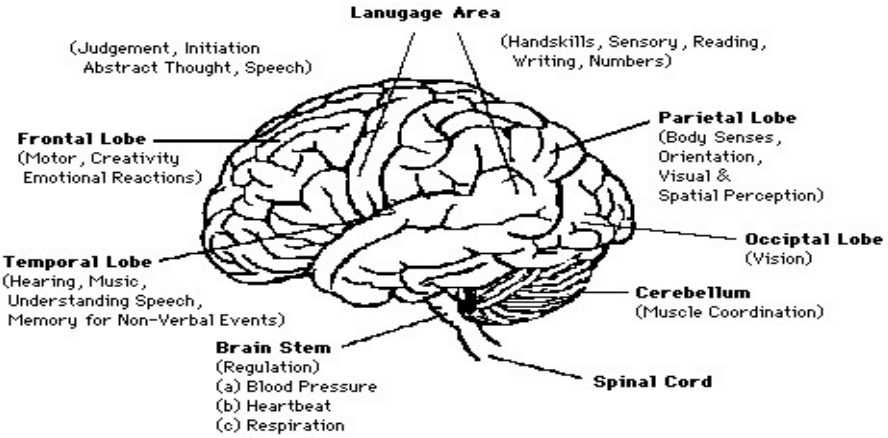
Temporal Lobes: The temporal lobes are above the ear level just in front of the occipital lobes. Their main function is to process auditory stimuli. They are responsible of some hearing, language and some aspects of memory, especially auditory memory, perception, emotional functions.

Frontal Lobes: The frontal lobes are the largest parts in the brain. Fogarty (2002, p. 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.

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, p. 342). 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.

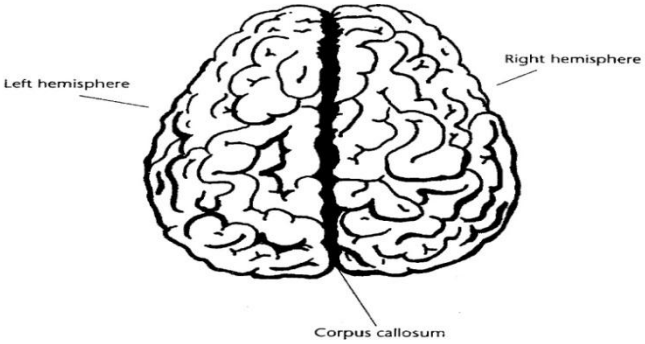
Figure 2.1. Localization of the Brain



Hemisphiricity

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 2.2. Hemispheres of the Brain



(Stevens & Goldberg, 2001, p. 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, 1989, p. 258). Also Jensen (1996, p. 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). 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, p. 26).

Brain Function

Physical needs which are air, water (hydrenation), sleep and nutrition of the brain and the function of memory are important in the function of the brain. One another factor is the psychological needs of the brain which are belonging, fun, freedom and power. Memory, in its varieties as semantic, episodic, procedural, automatic, and emotional is important in the function of the brain as well.

Memory

As Squire and Kandel (quoted by Sousa, 2001, p. 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, p. 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. 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. The activities that take information from short-term to long-term memory according to Fletcher (2001, pp. 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.

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.

Immediate Memory: Sousa (2001, p. 41) says that the immediate memory area is represented as a clipboard, 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.

Working Memory: The working memory is the second short-term memory and is the place where conscious process occurs. The working memory is represented as a work table, 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, p. 44). The working memory can handle few items at once and this depends to the age of the person.

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, p. 46). 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, pp. 116-119). There are five memory storage types. These are semantic memory, episodic memory, procedural memory, automatic memory, and emotional memory.

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.

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 (Springer, 1998, pp. 51-52).

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 (1998, p. 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, p. 82) also states that procedural memory helps us to learn things that don't require conscious attention and to habituate ourselves to the environment.

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.

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, 1998, p. 54).

Creating a Brain Compatible Classroom

In creating a more compatible classroom for university students the teacher should bear in mind that s/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 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.

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. 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 that 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, 2001, p. 10). The development of each area of the brain must be considered as we decide what to teach and how to teach it. (Sprenger, 1999, p. 43).

Focusing on Intelligences: Gardner (1983, p. 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. 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 (Cambell, 1996, p. xxi).

Identifying and Addressing Learning Styles: Humans learn with the input gained from their senses which are seeing, hearing, feeling, smelling, and testing. Teachers must identify which style is dominant to their learners and as Sprenger (2002, p. 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. The teacher should identify the students learning styles and design the course which includes all of the styles because as Lowes and Target (1998, p. 28) advice teachers that many teachers tend to be abstract thinkers who are analytical and organized in their approach to learning.

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, p. 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.

Setting a Safe and Secure Environment: Vincent (quoted Jensen, 1998, p. 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 there kinds of responses lead to problems. The teacher should avoid threat by encouraging and overcoming the threat of failure or low grades. 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.

Using Physical Activities: Using physical activities during the lessons will booster the learning process. 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. It is a fact that using physical activities during the lessons support the brain to function better and the memory to activate better.

Using Music: Music carries meaning and the brain's response to that meaning show 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 synthesing 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, p. 116).

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, p. 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.

Using Humour: Sousa (2001, pp. 63-64) states the benefits of humour as *Physiological Benefits:* More Oxygen, Endorphin Surge and *Psychological, Sociological, and Educational Benefits:* Gets Attention, Creates a Positive Climate, Increases Retention, Improves Everyone's Mental Health and Is an Effective Discipline Tool.

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 should be evaluates and in what circumstances should they should be levelled. 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 inhabited. Assessment in a brain compatible classroom has to be free as free of threat as possible. What

may be threatening to one student may not bother another (Stevens & Goldberg, 2001, p. 125).

Benefits of Brain Compatible Classrooms

The benefits of Brain Compatibly 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 a in them. But as Jensen (1996, p. 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.
- 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 environments 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. Karen and Kovalik (2001, p. 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 for 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 (Karen and Kovalik, 2001, p. 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.
- 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. You cannot 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.

Methodology

Research Questions

The research was conducted in order to answer the following questions:

1. Do the usages of a more brain compatible and traditional classroom improve the students' academic achievement in English?
2. Will there be a difference in the academic achievement scores of the students in the experimental and control group?

Subjects

The first year students who attend Kastamonu University, Education Faculty, Department of Primary Education participated in the research as subjects in the academic year of 2004-2005. 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 control group was equal, thirty in the experimental group and thirty in the control group.

Materials and Procedures

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

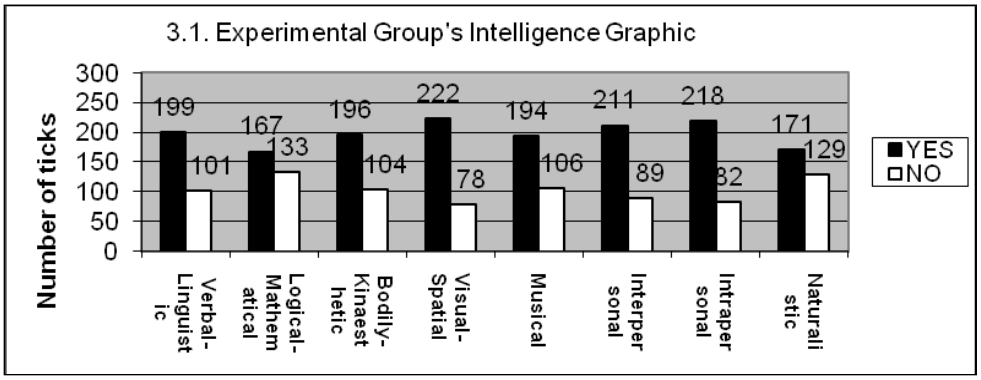
At the beginning of the course for the experimental group the process of learning, the brain function and the brain knowledge were given in the first course, so the students had to focus on the fact that learning was not a specific event but a phenomenon that has a function for a period of time according 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 information about beginning the courses the structure and the function of the brain and the general formation of the course during the study was given.

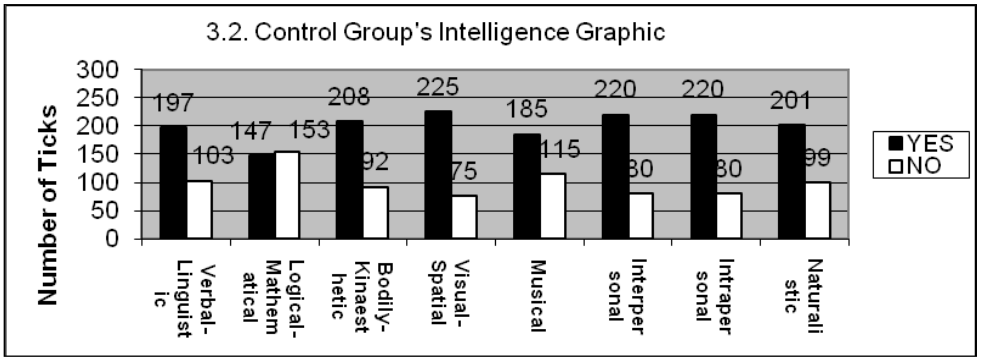
Before each course as a main aspect of brain compatible teaching what the students will learn and the objectives were given. The lesson was presented in the first, the most 17 minutes by the teacher, because they were aged at the least 19 years of age, the students were acquired to participate the lesson 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 will 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.

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.

Results of the Intelligence Inventory





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.

Results of the Learning Styles Inventory

3.1. Experimental and Control Group's Learning Styles Chart

VISUAL			*AUDITORY*		*KINAESTHETIC*	
Experimental		*Control*	*Experimental*	*Control*	*Experimental*	*Control*
PRIMARY	*24*	*22*	*3*	*2*	*5*	*6*
SECONDARY	*5*	*7*	*15*	*12*	*11*	*11*
TIRTIARY	*1*	*1*	*12*	*16*	*14*	*13*

As it can be seen in chart 3.1., 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 have kinaesthetic learning style as their secondary learning style. 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 in the experimental group and in the control group, 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 have kinaesthetic learning style as their secondary learning style. 1 student is visual, 16 auditory and 13 kinaesthetic learners as their tertiary learning style.

Results of the Brain Dominance Inventory

3.2. Experimental and Control Group's Brain Dominance Result Chart

	Experimental	Control
Left hemisphere dominant (Strongly)	1	1
Moderate left hemisphere dominant	6	7
Both hemispheres equal dominant	21	15
Moderate right hemisphere dominant	1	6
Right hemisphere dominant (Strongly)	1	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 in the experimental group and in the control group 15 students have an equally dominance hemispheres, 8 of them have left hemisphere dominance and 7 of them have right hemisphere dominance.

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

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	$\overline{X}$	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.

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	$\overline{X}$	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 significant difference in comparison of both the experimental groups' pre-test and post-test scores and the control groups' pre-test and post-test scores. 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).

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	$\overline{X}$	S	Sd	t	P
Experimental-	30	86,6333	8,91525			
Post & Control-	30	67,9333	12,01991	29	7,325	0,000
Post						
Experimental-	30	33,7667	21,97284			
Pre &				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 conducted. When the figures are examined in Table 3.3. it is obvious that there is a significant difference in the post-tests of the experimental and control groups' scores (in the level of P<0,001). There isn't a significant difference in the pre-test scores of the experimental and control group (P<0,05).

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' 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' 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' 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.

Conclusion

As a result of this study, it can be clearly said that even in the university level when teaching English, 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 easily 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 language teaching could have affected the learning phase more positively.

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