AN INVESTIGATION OF STUDENTS' ATTITUDES TOWARDS BRAIN-BASED APPLICATIONS IN ENGLISH COMPOSITION SKILLS II COURSE: A CASE STUDY

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ABSTRACT

AN INVESTIGATION OF STUDENTS' ATTITUDES TOWARDS BRAIN-BASED APPLICATIONS IN ENGLISH COMPOSITION SKILLS II COURSE: A CASE STUDY

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This thesis aims to examine students' attitudes towards brain-based applications in the English Composition II course. For this purpose, a case study was carried out with a group of 23 first year students at the Department of Foreign Language Education at Middle East Technical University in the second half of the 2002-2003 academic year.

After receiving writing training with a brain-based methodology for ten weeks, the students were given an attitude questionnaire which aimed at identifying their attitudes towards brain-based applications in the course. One week later, the

researcher also conducted interviews with 10 of the 23 students separately to investigate students' attitudes towards brain-based applications in the course further.

The analysis of the data collected through the attitude questionnaire indicated that 93 % of the students showed significant positive attitudes towards the brain-based applications, while only 1 % of the students had negative attitudes towards the brain-based applications.

The analysis of the results of the interviews also revealed that all students had positive feelings about the brain-based applications. Accordingly, the results indicated taking this composition course resulted in highly positive feelings such as confidence, relaxation, or being valued in the students.

All students found writing meaningful and relevant to themselves. They stated to have acquired various skills during the course such as writing skills, computer skills, teaching skills, emotional intelligence, and an awareness of needs. They found these useful and meaningful for their lives in general, as students, and as teachers as part of their future profession.

Keywords: Brain-based language teaching, course design, teaching writing, attitude

ÖZ

İNGİLİZCE KOMPOZİSYON II DERSİNDEKİ BEYİN-TEMELLİ ÖĞRETİM UYGULAMALARINA YÖNELİK ÖĞRENCİ TUTUMLARININ İNCELENMESİ: BİR DURUM ÇALIŞMASI

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Tez Danışmanı: Y. Doç. Dr. Alev Yemenici

Eylül 2003, 236 Sayfa

Bu tez, öğrencilerin İngilizce Kompozisyon II dersindeki beyin-temelli öğrenme uygulamalarına yönelik tutumlarını incelemeyi amaçlamaktadır. Bu amaçla, 2002-2003 akademik yılının ikinci yarısında Orta Doğu Teknik Üniversitesi Yabancı Diller Eğitimi Bölümü'nden 23 birinci sınıf öğrencisi ile bu çalışma gerçekleştirilmiştir.

10 hafta boyunca beyin-temelli öğretim metodolojisi kullanılarak kompozisyon eğitimi alan 23 öğrenciye, İngilizce Kompozisyon II dersindeki beyin-temelli öğretim uygulamalarına ilişkin tutumlarını ölçmeyi amaçlayan bir tutum anketi uygulanmıştır. Anket uygulanmasından bir hafta sonra, öğrencilerin

tutumlarını detaylı bir şekilde incelemek amacıyla, araştırmacı 10 öğrenci ile ayrı ayrı mülakatlar gerçekleştirmiştir.

Anket sonuçlarının analizi, öğrencilerin % 93 ünün beyin-temelli öğretim uygulamalarına yönelik kayda değer derecede olumlu tutumlar sergilerken, öğrencilerin sadece % 1 inin olumsuz tutumlar gösterdiğini ortaya koymuştur.

Mülakat sonuçlarının analizi de tüm öğrencilerin beyin-temelli uygulamalara ilişkin olumlu duygular beslediğini göstermiştir. Bu bağlamda, bu dersi almak, öğrencilerde kendine güven, rahatlama, ya da değer gördüğünü hissetme türünden duygular uyandırmıştır.

Yine tüm öğrenciler, yazmayı anlamlı, ve yaşantıları ve kendileri ile alakalı bulmuşlardır. Bu bağlamda, ders süresince, yazma becerileri, bilgisayar becerileri, öğretme becerileri, duygusal zeka ve ihtiyaçlarına ilişkin farkındalık gelişimi gibi becerileri edindiklerini dile getirmişler; tüm bu becerileri genel olarak yaşantıları, özelde de öğrencilik ve öğretmenlik kariyerleri açısından faydalı ve anlamlı bulmuşlardır.

Anahtar Kelimeler: Beyin-temelli dil öğretimi, ders geliştirme, yazma öğretimi, tutum

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Date: Signature:

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CHAPTER I

INTRODUCTION

1.0 Presentation

This chapter contains seven sections. The first one is the background and context of the study. Next, the research questions are pointed out. Following this, the purpose and the scope of the study are stated. Then, the significance and the limitations of the study are identified. Finally, overviews of the following chapters and the overall organization of the thesis are presented.

1.1 Background and Context of the Study

1.1.1 Background of the Study

Learning is for survival in its most primitive sense, if not an act of pleasure-seeking in its most advanced forms. Human beings, still the most developed species on the earth, successfully seek ways to cope with the paradox and ambiguity of the everyday life. Therefore, the human brain is constantly evolving and adapting itself according to the new demands and challenges of the changing world. Moreover, real learning -being deeply personal- is almost always a deep struggle involving the adjustment of beliefs (Caine and Caine, cited in Ronis, 2000).

Indeed, this description roughly provides the framework for brain-based learning. This is such kind of an educational environment that mirrors real-life experiences and donates the individual with lifeskills which are identified by Kovalik (1997) as integrity, initiative, flexibility, perseverance, orgaization, sense of humor, effort, common sense, problem-solving, responsibility, patience, friendship, curiosity, cooperation, caring, courage and pride. Different from the traditional factory-model educational approaches, in brain-based philosophies, the teaching/learning environment is designed in line with the way the brain and body function.

Actually, the findings of neuroscience and psychology provide us with many opportunities of brain-compatible implications for our classrooms. Caine and Caine (1991) present a very useful list of brain-based principles with their implications for classrooms.

1. The brain performs many functions simultaneously and learning is enhanced by a rich environment with a variety of stimuli. Here, the implication is that the teaching/learning context should be able to appeal to as many senses as possible and thus awaken the entire nervous system. Therefore, teachers should present content through a variety of teaching strategies, such as physical activities, individual learning times, group interactions, artistic variations, and musical interpretations to help orchestrate student experiences.

2. Learning engages the entire physiology; physical development, personal comfort, and emotional states affect the ability to learn. Therefore, teachers should be aware of the fact that children mature at different rates and get ready for learning

in their own pace; and health related factors such as nutrition, exercise and stress management should be integrated into the learning process.

3. The search for meaning is innate. Therefore, teachers should design meaningful and challenging lessons that invoke students' curiosity and search for meaning.

4. The brain is designed to perceive and generate patterns. Therefore, teachers should present information in context (real life science, thematic instruction) so the learner can identify patterns and connect with previous experiences.

5. Emotions and cognition cannot be separated. Emotions can be crucial to the storage and recall of information. Therefore, teachers should encourage and help the learners to become aware of and manage their feelings and develop a positive attitude about the school and its components.

6. Every brain simultaneously perceives and creates parts and wholes. Therefore, the content should not be presented in isolation; and teachers should design activities that require full brain functioning.

7. Learning involves both focused attention and peripheral perception. Therefore, teachers should use materials such as posters, art, bulletin boards, music outside the learner's immediate focus to influence learning.

8. Learning always involves conscious and unconscious processes. Therefore, teachers should encourage the learners to develop personal connections with the material at hand and help them consciously review/ actively process their learning through reflection and metacognition.

9. We have at least two types of memory: spatial, which registers our daily experience, and rote learning, which deals with facts and skills in isolation. Therefore, teachers should try to avoid emphasizing rote learning because it neglects the learners' personal side and thus might impair understanding.

10. The brain understands best when facts and skills are embedded in natural spatial memory. Therefore, teachers should appeal to as many senses as possible and try to create real world experiences in their lessons.

11. Learning is enhanced by challenge and inhibited by threat. Therefore, an atmosphere of relaxed alertness -low in threat, high in challenge- should be created.

12. Each brain is unique. The brain's structure is actually changed by learning. Therefore, teachers should employ various teaching strategies to attract individual interests and let students express their auditory, visual, tactile, or emotional preferences.

These twelve principles can provide a general framework for learning and teaching, and summarize the factors to be considered while designing and implementing brain-compatible lessons. Besides, Caine and Caine's principles of brain-based learning inherently incorporate the insights brought about by some other educational models such as the multiple intelligences theory as described by Teele (1997) and the integrative education model developed by Clark (1988). Brain-based learning theory shares certain features with the multiple intelligences theory and the integrative education model such as the engagement of positive emotions, arousing intrinsic motivation, formation of multiple memory pathways, making real-life connections to help generate patterns and meaningful learning, and the consideration that each brain is unique and people have multiple intelligences at varying degrees.

As a result, what Teele (1997) refers to in her description of the multiple intelligences theory is very similar to what is identified by Caine and Caine (1991). According to Teele, teachers instruct, facilitate, coach, and guide learning, growth and development of their students by providing content and methodology in ways that address all the intelligences. In an intelligence-compatible environment, students are able to construct their own meaning and demonstrate their knowledge through resourceful, creative and traditional methods; intrinsic motivation, positive self-image, and a sense of responsibility develop within students because they become active participants in the educational process through interactive, creative, cooperative and collaborative learning situations. Furthermore, the curriculum reflects a natural connection to real-life experiences; it is content-driven, theme-based, purposeful, integrated, meaningful, and involves strategies to reach all seven intelligences. Content requires the skills of problem solving, critical and creative thinking, and the application, analysis, evaluation and synthesis of the acquired knowledge.

As far as the integrative education model of Clark (1988) is concerned, this model –which is also brain-based- validates the framework presented by Caine and Caine (1991). Clark (1988) provides seven keys to accelerate learning. First, the learning environment needs to be responsive; that is, there are open, respectful and cooperative relationships, the environment is like a laboratory or workshop; the curriculum is flexible and integrative; the student is an active participant in the learning process; assessment, contracting, and evaluating are all used as tools to aid in the growth of the student; cognitive, affective, physical and intuitive activities are all valued; and the atmosphere is one of trust, acceptance and respect. Second,

tension should be reduced and there should be a relaxed environment. Relaxation techniques such as biofeedback, progressive relaxation, yoga breathing and meditation must be used. Third, physical movement is important to learning; therefore, arts and physical education should be integrated into the curriculum. Fourth, empowering language and behavior should be employed; when students are exposed to empowering language, they seem to be more responsible, more motivated and exhibit a positive self-concept. Fifth, students should be provided with choices and they should feel that they have the control over their preferences and experiences. Sixth, complex and challenging cognitive activities should take place in the classroom; by this way, teachers can engage the brain fully including the cortex (cognition), the brain stem (physical/sensory), the midbrain/limbic area (feelings) and the prefrontal (intuition). Finally, since new findings on human energy, meditation, personal space, fantasy, imagery, and dreams have much to offer to educational programs, intuitive abilities (mostly right-brain, prefrontal activities) need to be developed.

The above features and the advantages of the brain-compatible methodology as described along with the common features it shares with the multiple intelligences theory and the integrative education model are supported by the findings of brain research, cognitive neurosciences, psychology (both cognitive and experimental), previous educational methodologies (e.g., the constructivist theory and cooperative learning theory) and language teaching methodologies (e.g., the natural approach, suggestopedia, total physical response, and the communicative approach). In addition, the studies involving the application and implementation of the brain-based methodology reveal that learners depict significant improvement subsequently. For

instance, Super Camp Project in which Jensen (The International Association of Supervision and Curriculum Development [CASCD], 1997) and his colleagues made use of accelerated learning tools, integrated music throughout the day, and used thematic integrated curriculum, movement, cooperation and stress reduction techniques produced astounding results. Jensen states that learners became very autonomous and competent, and that the average GPA after a full year in the camp was a full letter grade above what the student's baseline entering grades were. Similar results were gained by the Project Zero by Gardner (Project Zero). However, although brain-based applications in general brought about earth-shattering results, the literature lacks its implementation and applications in language teaching contexts. Therefore, it can be concluded that further research to investigate the validity and the efficiency of the brain-based methodology in language teaching is needed. For this purpose, the researcher of this study –after an extensive review of the relevant literature on brain research and brain-based learning- developed a brain-based language teaching model, and designed and taught an English composition/writing course based on the principles and applications of her brain-based language teaching model.

Furthermore, since the application and implementation of the brain-based learning theory in the field of English language teaching, specifically in training students in writing skills, promises much to the students at the Department of Foreign Language Education at METU, it is essential to identify students' affective/emotional reactions towards such applications. Thus, the need to investigate students' attitudes towards the brain-based applications as a result of being exposed to the brain-based writing training initiated this study.

1.1.2 Context of the Study

This study on the students' attitudes towards the brain-based applications in English composition course was conducted at Middle East Technical University (METU) in the Department of Foreign Language Education (FLE) at the Faculty of Education. The students who are placed in the Department of Foreign Language Education (FLE) have to take the METU English proficiency exam since English is the medium of instruction at METU. This exam is composed of 135 multiple-choice questions to assess test-takers' English proficiency in grammar, vocabulary, and reading. The ones who get a grade over 60 (out of 100) in the exam can enroll in their first year departmental courses. Otherwise, they need to attend the English Preparatory School at the Department of Basic English for one year to improve their English language proficiency. At the end of an academic year in the Department of Basic English, students take the METU proficiency exam, and the FLE students who pass the exam move to their departments.

Being a 4-year teacher training institution, METU FLE Department aims to provide the necessary background for those who intend to teach English. The courses offered in the FLE curriculum can be classified as language improvement, literature, linguistics, methodology, and elective courses. Language improvement courses are taught in the first year. The list of the first year compulsory courses is as follows: the first term's courses are English Grammar I, Reading Skills I, Spoken English I, English Composition I, and Introduction to Literature and the second term's courses are English Grammar II, Reading Skills II, Spoken English II, English Composition II, and Short Story Analysis and Teaching.

The first year English Grammar I and II courses aim to increase students' awareness of how meaning is created through structure and to focus on the relation between form and meaning. The main aim of the Reading Skills I and II courses are to enable students to develop the sub-skills of reading such as skimming and scanning, to help them read authentic and structurally complex texts efficiently, and to emphasize analytical and interpretational skills. The major aim of the Spoken English I and II courses are to develop speaking skills in interaction-based activities (like roleplay, drama) that involve students in active communication, to improve the students' pronunciation, accuracy and fluency in their spoken language (through presentations, dialogues, and debates). In their first year literature courses, students are presented with the fundamental terms and concepts of literature through studying texts from various genres (such as poems, short stories, plays).

The students also take the English Composition I and II courses the aim of which is to make students understand the nature of the writing process and improve their academic writing skills. In the English Composition I course, first learners receive instruction on topic sentence, controlling idea, generating ideas for the support, and conclusion of a paragraph. After students learn how to write a paragraph, different paragraph types, such as narrative, descriptive and expository, are studied. In English Composition II course, students are instructed on thesis statement, central idea, and parts of an essay (introduction, developmental, and conclusion paragraphs). After they learn how to write an essay, different essay types, such as classification, comparison, cause-and-effect and argumentative, are studied.

The fact that there are not many studies conducted to investigate students' attitudes towards the brain-compatible applications in language teaching settings - though this methodology is strongly supported by the insights from previous educational methodologies and the findings of research from many fields including cognitive neuroscience, brain research and psychology- initiated this case study to implement and experiment with the brain-based methodology in writing (English Composition II) training in the context of the Department of Foreign Language Education at METU to find out the students' attitudes towards such applications.

1.2 Research Question(s)

This study addressed the following research question:

1. What are the students' attitudes towards brain-based applications in the English Composition II course?

In this respect, this study aimed to find answers to the following subquestions:

   a. What are the students' attitudes towards the features of physical setting/environment in the course?
   b. What are the students' attitudes towards the features of teacher-student roles and interaction in the course?
   c. What are the students' attitudes towards the features of curriculum and instruction in the course?

d. What are the students' attitudes towards the features of assessment techniques and procedures in the course?

1.3 Purpose and the Scope of the Study

The purpose of this study was to identify students' attitudes towards brain-based applications in the English Composition II course. To fulfill this aim, the following steps were followed:

(i) developing a brain-based language teaching methodology/ model based on an extensive review of relevant literature on brain research and brain-based learning,

(ii) designing a ten-week brain-based English composition course based on the principles and applications of the researcher's brain-based language teaching model (as described in 3.4 section of this thesis),

(iii) implementing the course for ten weeks with the students,

(iv) administering the attitude questionnaire on students' attitudes towards brain-based applications after implementing the course, and

(v) interviewing the students on their feelings and opinions about the brain-based applications and the course.

1.4 Significance of the Study

This study on the students' attitudes towards writing training with a brain-compatible methodology was needed for three reasons.

First of all, there are not many applications of the brain-based learning methodology in language teaching settings in Turkey. Therefore, this study aimed to experiment with this methodology and draw useful conclusions and implications for educational settings.

Besides, students' attitudes are key factors in determining better ways of delivering instruction.

In addition, in terms of the students' entry characteristics as to their previously existing attitudes towards writing, the researcher observed that the majority of the students entering the Department of FLE had negative attitudes towards writing. When eliciting information about their needs and interests related to writing as part of the needs assessment process, it was seen that their dislike of the writing activity stemmed from their previous negative experiences of writing during their earlier years of education during which writing was regarded as a trivial and useless act, receiving little or no attention. Therefore, a radical paradigm shift was needed in teaching writing to correct these paralyzing experiences and help students develop positive feelings about writing which is actually an act of exploring and expressing their internal and external worlds.

Moreover, present language teaching methodologies applied in the teaching of first-year courses in the Department of FLE seem to fail as the students cannot demonstrate a desired level of language proficiency subsequently. More specifically, for the composition course, the students are criticized for being unable to transfer and apply the academic writing skills they are supposed to have acquired previously in the first year in their second, third, and fourth year courses. Students' lack of such

knowledge and skills may stem to a great extent from their negative attitudes towards the classroom practices in such courses.

As an extension of the same problem, after graduation, the students are not employed as language teachers by the prestigious colleges and universities in Turkey, and they lack the confidence to pursue further professional development (such as graduate or post-graduate studies). Therefore, the application and implementation of brain-based learning theory in the field of English language teaching, specifically in training students in writing skills, as described in this thesis promises much to the FLE students as they might develop positive attitudes towards brain-based practices, which may enhance their learning and make it long-lasting to be used in their future life both as part of their profession/career and life in general.

Finally, this study might serve as a useful source for the course developers and instructors in incorporating brain-compatible practices into their courses and instruction.

1.5 Limitations of the Study

This study was a case study including only 23 students at the Department of FLE of METU, which limits generalization of the results for all (Turkish) students.

In addition, since applying brain-compatible theory in school settings inherently requires a radical and marginal paradigm shift, the students –grown up in traditional educational settings- initially demonstrated resistance to change (especially in process-oriented learning and evaluation, self-observation, application of movement/physical activity, incorporation of music, setting personal goals, etc.).

Moreover, the fact that the researcher was also the instructor of the course might have affected the reliability of the study to some extent. The researcher herself administered the attitude questionnaire and conducted the interviews, which might have influenced the students' responses.

Furthermore, since this was a case study conducted with a group of students in the Department of FLE, it was not possible to use simple random sampling method due to the regulations of the FLE Department. The students were put into sections alphabetically according to their surnames. Then, they were assigned randomly to the instructors. The students in this section which was assigned to the instructor for the English Composition II course were the subjects of the study. That is, cluster random sampling method was used. If simple random sampling method was used, it would be very likely to produce a representative sample.

1.6 Overview of Methodology, Data Analysis and Interpretation of Results

1.6.1 Overview of Methodology

1.6.1.1 Design of the Study

This case study on students' attitudes towards brain-based applications was carried out in the English Composition II course with a group of 23 first year students at the Department of Foreign Language Education at Middle East Technical University in the second half of the 2002-2003 academic year. The researcher was involved in the study as the course designer and course instructor.

As the first step of the study, the researcher conducted an extensive literature review on brain-based learning to identify the features of brain-based applications

and design a brain-based language teaching model. Then, the researcher designed and taught the ten-week English Composition II course according to the principles and applications of the brain-based language teaching methodology/model she had previously developed.

In the next step of the study, the researcher collected the data. First, a questionnaire was developed by the researcher to reveal students' attitudes towards brain-based applications by making use of the features of brain-based language teaching as described by her model. An attitude questionnaire –used in another study and analysed in terms of reliability and validity issues- could not be found in the literature to adapt for this study since a totally new model was implemented in this study. Hence, the researcher prepared a new attitude questionnaire based on the questionnaire construction techniques described by Griffee (1999), and Gardner and Masgoret (2003).

Then, to study students' attitudes towards the brain-based applications in greater depth, the researcher prepared questions to be asked in the interviews.

In this study, two kinds of instruments were used to collect data: questionnaire and interview. Then, the data collected from the questionnaire and the interviews were analyzed and interpreted to find out the answer for the research question which investigated students' attitudes towards brain-based applications in this course.

1.6.1.2 Subjects

The study was conducted with a group of 23 first-year students in their English Composition II course in the Department of Foreign Language Education

(FLE) at METU. The age range of the subjects was 18-20. All of the students belonged to the same cultural and linguistic background. They were all Turkish and Anatolian Teacher Training High School graduates. Besides, the students were familiar with the researcher/instructor since they took the English Composition I course from the same instructor in the previous term.

1.6.1.3 Brain-Based English Composition II Course

A ten-week brain-based English composition course was designed and implemented for the purposes of this study (see the course outline in Appendix A). First a brain-based language teaching model for teaching writing skills was developed by the researcher, and second the course was implemented.

1.6.1.4 Data Collection Instruments

For the purpose of this study which aimed to investigate students' attitudes towards brain-based applications in English Composition II course, both quantitative and qualitative data were collected. The quantitative data were collected through an attitude questionnaire. The qualitative data were collected through interviews.

1.6.2 Overview of Data Collection Procedures

To collect quantitative data, an attitude questionnaire was administered to the students to answer the research question on students' attitudes towards brain-based applications with respect to the features of physical setting/environment, teacher-student roles and interaction, curriculum and instruction, and assessment techniques

and procedures upon the completion of English Composition II course at the end of the study.

Again, to collect qualitative data and to obtain more detailed information about students' feelings and opinions about the brain-based applications in the English Composition II course, 10 of the 23 students were interviewed. Different from the attitude questionnaire and in addition to investigating how students felt about the brain-based applications, the interview questions also aimed at revealing why students felt the way they felt and exploring their opinions, likes and dislikes, suggestions and preferences about the brain-based practices in the English Composition II course. The interviews were conducted one week after the administration of the attitude questionnaire.

1.6.3 Overview of Data Analysis and Interpretation Procedures

Firstly, the analysis of the quantitative data obtained from the attitude questionnaire is presented. Secondly, the analysis of the qualitative data collected through interviews is analyzed. Finally, the results are interpreted and discussed.

In this study, the responses for the questionnaire were analysed in two different ways. First, analysis of the questionnaire was done through calculating the mean score for each item in the questionnaire separately. Second, the frequency and the percentages of students' responses were identified. Then, the results were presented in tables.

In this study, responses to the interview questions were analyzed via cross-case analysis, identifying students' general tendencies by the common answers given by the students. Then to analyze the interviews, first the interviews were

transcribed. Later, each response for the questions was analyzed and grouped under related headings. Finally, the results were presented in frequency tables.

1.7 Organization of the Thesis

This thesis is composed of five chapters.

The second chapter consists of the literature review in which the basic brain anatomy with a specific emphasis on the neurons, neural activities, different parts of the brain and their various functions is explained. Moreover, it presents a closer look at the general organization of the nervous system and its components and the endocrine system. Next, relevant brain findings concerning various important educational themes including attention, consciousness, motivation, stress, emotions, the meaning-making process, memory formation and recall are explained in detail. Finally, in line with the definition and framework of a language teaching methodology, this chapter presents what language is and how language is learned.

The third chapter is composed of the method of data collection. In this part, the design and the research questions of the study are presented. Next, information about the participants of the study is given. After that, brain-based language teaching model developed by the researcher is explained with specific references to the English composition course. Finally, data collection instruments are explained.

The fourth chapter presents the data analysis and interpretation of the results. In this part, both the quantitative and the qualitative data are analyzed. Firstly, the analysis of the quantitative data obtained from the attitude questionnaire (mean score and percentage analyses) are presented. Secondly, the analysis of the

qualitative data collected through interviews (cross-case analysis) are analyzed. Finally, the results are interpreted and discussed.

The fifth chapter is the conclusion which summarizes the study and presents its results in relation to the research question and subquestions of the study. Then, the study is assessed and its implications for further research are discussed in this chapter.

CHAPTER II

LITERATURE REVIEW

2.0 Presentation

This chapter contains four sections.

In the first part of the literature review, basic brain anatomy is explained, with a specific emphasis on the neurons, neural activities, different parts of the brain and their various functions. This part aims to provide an initial exploration of what the brain's composing units are and how different parts of the brain operate to create the context for the comprehension of how the brain works.

The second part presents a closer look at the general organization of the nervous system and its components. In addition, the endocrine system is explained in connection with the nervous system in the same part. This part aims to prove how the brain and body work in interaction and collaboration to keep the metabolism's natural balance at its proper state. In addition, this section underlines the fact that physiological states exert a great influence on the cognitive activities of a person.

In the third part of the literature review, relevant brain findings are presented and evaluated concerning various important educational themes including attention, consciousness, motivation, stress, emotions, the meaning-making process, memory formation and recall. This section aims to provide the essential connection between

what happens at the physiological and psychological levels in learners and what happens in educational settings. It also presents direct implications and applications for the teaching/learning situations.

In the fourth part of the literature review, in line with the definition and framework of a language teaching methodology, the researcher presented what language is and how language is learned.

2.1 Basic Brain Anatomy

2.1.1 Neural Growth and Myelination

To know how the brain works, one must first gain an understanding of the different cells that compose it. It is only because certain of these cells make signals, chemical and electrical, that one is able to think and feel and is able to recall how he thinks and feels.

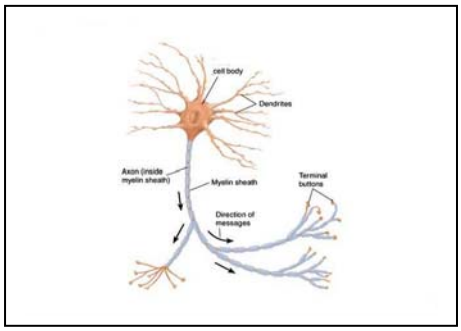

Figure 1. Nerve Cell (Neuron)
(adapted from: http://www.driesen.com/brain_view_-_5.htm)

The brain has two kinds of cells: nerve cells, or neurons, and glial cells (D'Arcangelo, 1998). The cellular space between the nerve cells and their circuits is

filled by specialized support cells called glia. One has about 1000 billion glial cells, which means that there are ten times as many glia as there are nerve cells.

Glial cells appear to play a role in the formation of blood-brain barrier, the transport of nutrients, the removal of dead cells, the structural support for firmness and the regulation of the immune system (Jensen, 1998). Unlike nerve cells (neurons), glia have the capacity to divide to form new cells.

As for the neurons (see Figure 1 above), they are the only cells that process information. Each being composed of a cell body, dendrites (branches that extend from the cell body and function to receive stimuli and conduct impulses to the cell body) and an axon (another type of extension from the cell body conducting impulses away from the cell body), the billions of neurons in the human nervous system work by receiving messages from and sending messages to other nerve cells. Sending cells and receiving cells are linked to each other in circuits.

Each nerve cell acts like a relay station, receiving signals from other cells, processing the signals and sending them to other cells across tiny gaps called synapses. The actual linking sites, the specific communication points on the surfaces of nerve cells, are the synapses, and the process of information transfer at such sites is called synaptic transmission. Therefore, actually nerve cells don't touch, rather they communicate through synaptic transmission by the production of chemicals called neurotransmitters (see Figure 2 below).

In this process, the neurotransmitter is produced in the cell body and stored in little sacks down in the axon terminals. When a neuron fires, an electrical impulse moves down the axon and stimulates those little sacks of chemicals in the axon terminal to move to the surface, break open and spew their contents out into the gap

between the axon terminal and the dendrite of a neighboring cell (this gap is called the synaptic gap/cleft). The dendrites have little receptor sites, designed specifically for a particular neurotransmitter. The chemicals fit into the receptor sites kind of a lock and key. This causes a new reaction in the receiving dendrite, which then sends a message down that cell's axon and starts the whole process over again. This electrochemical process is the basis of all human behavior (D'Arcangelo, 1998).

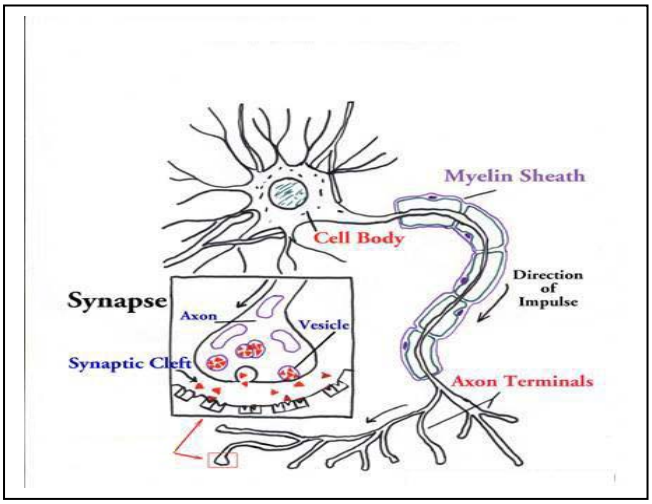

Figure 2. Synaptic Transmission
(adapted from: http://www.educarer.com/brain.htm)

Moreover, the neurotransmitters might either excite the cells to make actions happen or inhibit their activities to keep them under control. Some of the neurotransmitters are directly related with the educational settings such as acetylcholine, dopamine, serotonin, noradrenaline, endorphin, calpain, and GABA.

First of all, acetylcholine is generally excitatory and affects arousal, attention, memory, motivation, and movement (Howard, 2000; Jensen, 1998). Next, dopamine inhibits a wide range of behaviour and emotions, including pleasure

(Jensen, 1998). Besides, serotonin –being important for sleep onset, mood and eating behavior- inhibits all activites. Together with noradrenaline, it is associated with the reticular activation system; that is, their extreme levels prevent flexible switching of attention. Low levels of serotonin are linked to depression, while its increased levels lead to sleep and relaxation (Howard, 2000: Jensen, 1998).

In addition, noradrenaline is generally excitatory and affects arousal, wakefulness, learning, memory and mood (Jensen, 1998). Because of the release of this neurotransmitter as a result of sympathetic arousal (how the sympathetic system gets activated is explained in the 2.2 and 2.3 sections of this thesis), people can vividly remember moments of shock, fright, or anger (Howard, 2000).

Besides, endorphin inhibits transmission of pain messages and is released in the presence of pain and relaxation exercises (Howard, 2000: Jensen, 1998). Moreover, the neurotransmitter calpain dissolves the protein buildup at the synaptic gap, preventing its interference with the ability of neural messengers to jump the synapse (Howard, 2000).

Finally, low levels of GABA (an inhibitor) in combination with low levels of serotonin cause violence and aggression, while they are associated with passive behaviour at high levels.

In addition to growing new neurons (some neurons in the hippocampal area can regenerate a severed portion or sprout new branches under certain conditions), one can grow new connections (circuits) between neurons, and these connections create learning and memory. As a result, neural growth takes place when the dendrites of neurons firing in synch form new connections. As these neurons fire more together through review and meaningful repetition, these connections become

stronger. Furthermore, the axons of these neurons get insulated by myelin (a compact wrapping material formed by layers of membrane from a specific glial cell). This is called the myelination process through which the axons are specialized for the rapid conduction of electrical impulses (Diamond, 1998).

By neural growth and myelination, neurons start to fire more readily and long-term memory formation takes place.

2.1.2 Neural Pruning

Since neural growth takes place as a result of the continuous stimulation of the neurons, neural pruning –neuron or connection loss- results from a lack of sensory stimulation, or experience. This is simply due to the fact that neurons must have a purpose to survive and they have a drive to communicate and if they fail to receive and transmit information they become damaged and die (Diamond, 1998).

In line with the above reasoning, weaker synaptic connections –which are rarely used and not welded into permanent circuits- are eliminated through synaptic pruning while stronger connections –which are frequently activated through experience- are preserved and strengthened (Diamond, 1998).

2.1.3 Neural Plasticity

The presence of the two neural processes –neural growth and neural pruning- provides evidence for the fact that the brain has a capacity to modify itself depending on the type and amount of usage (Healy, 1990; Green, Greenough and Schlumpf, 1983, as cited in Jensen, 1998).

This ability of the brain to organize and reorganize its neural circuits/pathways in response to new experiences and sensory stimulation is called neural plasticity (Diamond, 1998).

Further evidence for such a capability is documented by research on patients with language impairment. Bloom and Lazerson (1988) report the example of 13-year-old Genie –the girl who was reared in isolation and deprived of linguistic exposure since her birth. Although she could not speak or comprehend speech when she was found, she learned some language after she received some training and was exposed to language.

Evidence for neural plasticity is also well documented by the research on infants who undergo hemispherectomy (the removal of the cortical covering of an entire hemisphere) procedures. The language development of children whose left hemispheres were removed in infancy does not show any deficits. This depicts that the development of language function shows plasticity and that areas in the right brain are able to take over the responsibilities of the areas in the left brain -part of the brain programmed for language function in most people (Bloom & Lazerson, 1988).

As a result, the malleable brain has an infinite capacity for taking on new responsibilities/functions or compensating for the lost functions although it seems to have a modular organization (meaning that, each part of the brain carries out a different function).

2.1.4 Parts of the Brain and Their Functions

The adult human brain weighs about three pounds (1300-1400 grams) and is made up primarily of water (78 percent), fat (10 percent), and protein (8 percent) (Jensen, 1998). Although the brain is about 2 percent of an adult's weight, it consumes about 20 percent of the body's energy and its primary source of energy is blood which supplies nutrients like glucose, protein, trace elements, and oxygen to the brain (Jensen, 1998).

2.1.4.1 The Cerebrum and The Four Lobes

From the outside, the thick outer covering of the brain is called the cerebrum which consists of four paired lobes within two convoluted hemispheres.

The cerebrum is concerned with higher brain functions including the perception of sensory impulses, the initiation of voluntary movement, the storage of memory, thought processes, reasoning ability, and instinctual and limbic (emotional) functions (Van de Graaff, 1998).

The cerebrum consists of two separate hemispheres (right and left) whose portions are connected internally by the corpus callosum, a bundle of nerve fibers that connect the left and right hemispheres. The two cerebral hemispheres perform different functions: while the left hemisphere is responsible for analytical and verbal skills, such as reading, writing, and mathematics, the right hemisphere is the source of spatial and artistic kinds of intelligence. However, at the operational level, for the coordinated realization of these different functions, the two hemispheres must operate together rather than functioning as separate structures. It is the corpus

callosum that unifies attention and awareness between the two hemispheres and permits a sharing of learning and memory (Van de Graaff, 1998).

The outermost layer of each hemisphere is subdivided into four lobes, or sections, and each lobe carries out different functions (see Figure 3 below).

The frontal lobe (involving primary motor area, premotor area, frontal eye field area, and Broca's area) is the area around one's forehead and primarily responsible for initiating voluntary motor control, providing responses relating to personality, mediating responses related to reasoning, judgment, planning, memory and emotions, and verbal communication (Van de Graaff, 1998).

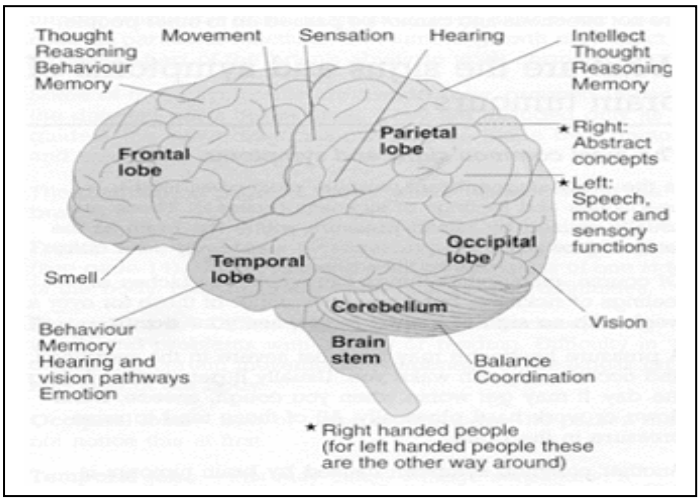

Figure 3. Lobes of the Brain
(adapted from: http://www.cancerbacup.org.uk/info/brain/brain-3.htm

The parietal lobe (involving general sensory area, somesthetic association area, and gustatory/taste area) is on the top back area. It functions in responding to higher sensory stimuli, understanding speech, formulating words to express thoughts and emotions, and interpreting textures and shapes (Van de Graaff, 1998).

The temporal lobe (involving primary auditory area, auditory association area, vestibular area, and primary olfactory/smell area) is located below the parietal lobe and around the ear. It is involved with the interpretation of auditory sensations (hearing), the comprehension of language, and the storage (memory) of auditory and visual experiences (Van de Graaff, 1998).

The occipital lobe (involving primary visual area and visual association area) is in the middle back of the brain. It is primarily responsible for vision: the integration of eye movements by directing and focusing the eye, the association of visual images with previous visual experiences and other sensory stimuli, and the conscious perception of vision (Van de Graaff, 1998).

All of these lobes receive external stimuli from the opposite side of the brain, through the brain stem and the limbic system (these structures are explained in section 2.1.4.3). Then, this input is integrated and organized with sensory-motor memory in association and gnostic areas of the neocortex; thus, the new experiences are understood with reference to the past experiences (Hannaford, 1995).

2.1.4.2 Language in the Brain

Based on the studies primarily with aphasic patients –people who have speech and language disorders due to damage to specific language areas of the brain, the language areas are generally located in the cerebral cortex of the left hemisphere (Van de Graaff, 1998).

Research findings also indicate that in over 95 percent of all right-handed people with no history of early brain damage, the left hemisphere controls speech and language; in the remaining 5 percent, speech is controlled in the right

hemisphere. In addition, about 70 percent of left-handers have left-hemisphere control over language, while 15 percent of them have speech in the right hemisphere and the remaining 15 percent show evidence of bilateral speech control (Bloom & Lazerson, 1988). Besides, Kotulak (1996) states that 90 percent of right-handers process speech and language in the left side of their brains, while 30 percent of left-handers process language in the right side of their brains.

Furthermore, research findings depict that even in cases when there is left hemisphere dominance in speech and language, it is the right hemisphere that registers stress, intonation, prosody, rhythm, and the orthography of the language; thus, brain lesions in the right hemisphere lead to language deprived of stress, intonation, prosody, rhythm and emotion, and causes inability to comprehend wholes and impaired writing ability (Ergenç, 1999).

Figure 4 below displays the brain structures that function in the mediation of speech and language.

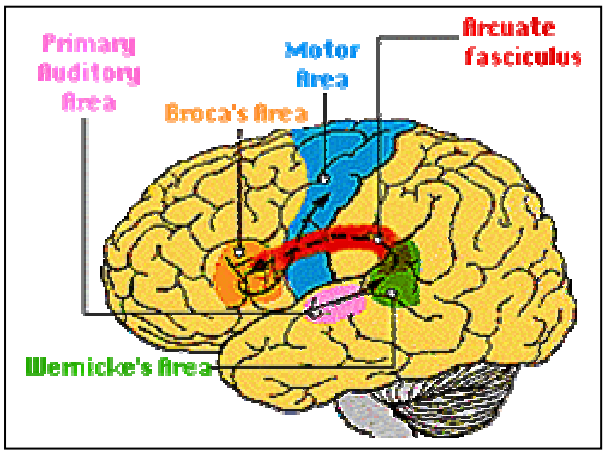

Figure 4. Language in the brain I
(adapted from: http://www.missouri.edu/~psyscott/p279o10.html)

The motor speech area (Broca's area) is located in the left frontal lobe.

> Neural activity in the motor speech area causes selective stimulation of motor impulses in motor centers elsewhere in the frontal lobe, which in turn causes coordinated skeletal muscle movement in the pharynx and larynx. At the same time, motor impulses are sent to the respiratory muscles to regulate air movement across the vocal folds. The combined muscular stimulation translates thought patterns into speech.
>
> (Van de Graaff, 1998, p. 359).

Brain lesion in Broca's area (called Broca's aphasia) causes difficulty in the motor act of producing language, comprehension impairment, and reading and writing impairment (Bloom & Lazerson, 1988).

The speech comprehension area (Wernicke's area) is located in the temporal lobe and directly connected to Broca's area by a bundle of nerve fibers called the arcuate fasciculus. This indicates that the concept of words to be spoken originates in Wernicke's area and is then transferred to Broca's area through the arcuate fasciculus (Van de Graaff, 1998). Damage to the Wernicke's area (called Wernicke's aphasia) results in speech comprehension impairment, production of fluent but odd or meaningless speech, use of nonexistent words, preservation of the rhythm and intonation and grammatical form, and reading and writing impairment (Bloom & Lazerson, 1988). Moreover, word deafness, damage to the area connecting Wernicke's area to auditory inputs, causes an inability to comprehend spoken language (Bloom & Lazerson, 1988). Besides, brain lesions in the arcuate fasciculus (called conduction aphasia) lead to fluent but meaningless speech, partial ability of comprehension and reading, and inability to repeat phrases correctly (Bloom & Lazerson, 1988).

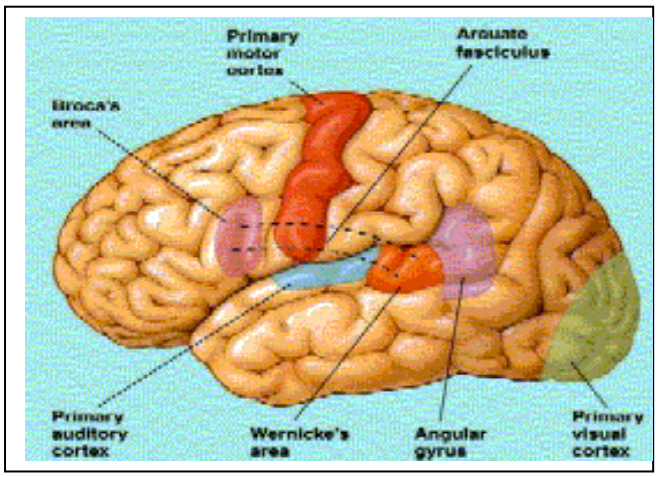

Figure 5. Language in the brain II
(adapted from: http://faculty.fortlewis.edu/benz b/engl463/lingresources.html

In addition, there is the angular gyrus at the junction of the temporal, parietal, and occipital lobes (see Figure 5). This part is believed to be a center for the integration of auditory and visual information due to the fact that patients with language impairment in reading and writing have damage to the angular gyrus (Van de Graaff, 1998). Besides, brain lesion in the angular gyrus (called anomic aphasia) causes an inability to think of a specific word, or the name of a person or an object (Bloom & Lazerson, 1988).

2.1.4.3 Forebrain, Midbrain, and Hindbrain

In this section, the major anatomical regions of the brain and their subdivisions are identified. The anatomical organization of the brain is hierarchical - although its operational organization often is not- consisting of the forebrain, the midbrain, and the hindbrain (see Figure 6 below).

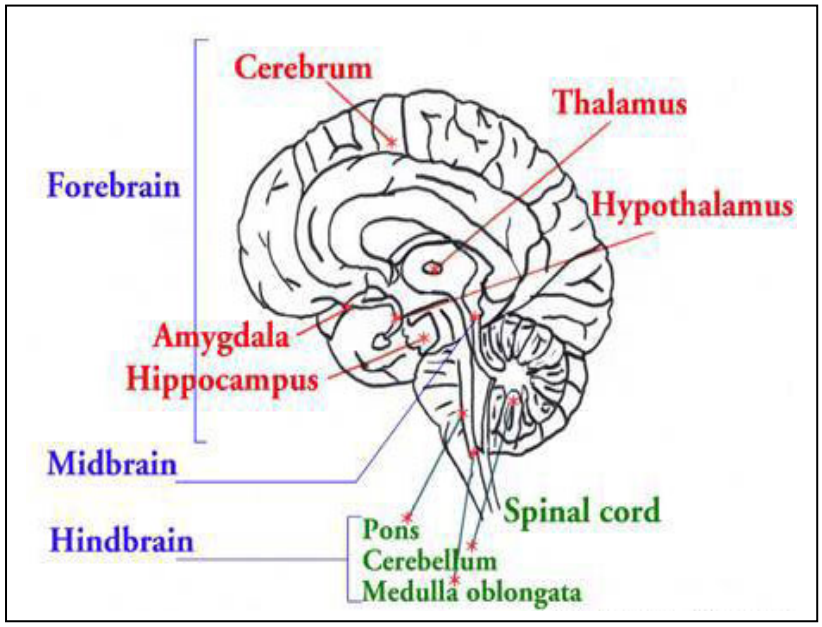

Figure 6. Forebrain, midbrain, and hindbrain
(adapted from: http://www.educarer.com/brain.htm)

The components of the *forebrain (prosencephalon)* are the telencephalon (the cerebrum), the limbic system, and the diencephalon (the thalamus, the hypothalamus, and the pituitary gland).

As it has been mentioned before, the cerebrum is the outermost layer of the brain and involved in higher brain functions including the perception of sensory impulses, the initiation of voluntary movement, the storage of memory, thought processes, reasoning ability, and instinctual and limbic (emotional) functions (Van de Graaff, 1998).

Under the cerebrum lie the components of the limbic system which involve the amygdala, hippocampus, basal ganglia, and septum. They function together to help regulate emotion, memory, and certain aspects of movement (Bloom & Lazerson, 1988).

The thalamus is a paired organ, with each portion positioned below the cerebrum of its respective cerebral hemisphere. The principal function of the thalamus is to act as a relay center for all incoming sensory impulses (except smell/olfactory) to precise locations within the cerebral lobes for interpretation. It is the cerebral cortex which discriminates pain and other tactile stimuli, while the thalamus is the place for general sensory interpretation. It also plays a role in initial autonomic response of the body to intense pain (Van de Graaff, 1998).

The hypothalamus, placed right below the thalamus, performs various autonomic and limbic (emotional) functions such as the regulation of heart beat, body temperature, water and food intake, sleeping and wakefulness; the regulation of emotional responses, including anger, fear, pain and pleasure; and the control of hormone release.

The pituitary gland, placed below the hypothalamus and attached to it, has an endocrine function and functions in the release of nine different hormones, including ACTH and vasopressin.

The *midbrain (mesencephalon)*, the region right below the diencephalon, is composed of the superior colliculi, the inferior colliculi, the cerebral peduncles, the red nucleus, and the substantia nigra.

The superior colliculi relay visual information while the inferior colliculi relay auditory information (Bloom & Lazerson, 1988).

The cerebral peduncles are a pair of cylindrical structures composed of projection fiber tracts that support and connect the cerebrum to the other regions of the brain (Van de Graaff, 1998).

Under the cerebral peduncles lies the red nucleus which connects the cerebral hemispheres and the cerebellum and functions in reflexes concerned with motor coordination and maintenance of posture.

Inferior to the red nucleus lies another nucleus called the substantia nigra which inhibits forced involuntary movements.

The *hindbrain (rhombencephalon)*, lowest region of the brain, is composed of the metencephalon (the pons and the cerebellum) and the myelencephalon (the medulla oblongata) (Van de Graaff, 1998).

The structures within the pons, the medulla, and the cerebellum interact with the cerebrum (telencephalon) by relays through the midbrain and the diencephalon.

The pons and medulla, which control respiration and heart rhythms, are critical to survival. Moreover, the neurons in the pons secrete the neurotransmitter norepinephrine which causes depression at low levels and severe stress reactions at high levels. The activation of the pons is also linked to the onset of heightened responsiveness/attentiveness, which assigns this area an important role in learning contexts (Bloom & Lazerson, 1988). As to the medulla, it regulates the activities of the autonomic nervous system (for a detailed description of the autonomic nervous system, see section 2.2.2).

In addition, the cerebellum, which receives and modifies information related to body and limb position before that information makes its way to the thalamus and cortex, stores the basic repertoire of learned motor responses which the motor cortex may request. (Bloom & Lazerson, 1988). Moreover, Jensen (1998) states that there is a strong link between the cerebellum and memory, spatial perception, language, attention, emotion, nonverbal cues, and even decision making. His conclusions are

based on the findings of the studies on patients who had cerebellar damage and thus had impaired cognitive function, or the studies which had shown that autistic children had smaller cerebellums and fewer cerebellar neurons. In addition, researchers had spectacular success with autistic and brain-damaged children by using intense sensory integration therapy and engaging physical education, movement and games in boosting cognition (Jensen, 1998).

2.2 An Overview of the Nervous System and the Endocrine System

2.2.1 Basic Functions

One is made aware of one's internal and external environments by the neurons (nerve cells), which are easily stimulated (excitability) and capable of conducting electrochemical impulses. Thus, such awareness is achieved by the nervous system whose basic structural and functional units are neurons. The nervous system, along with the endocrine system, functions to coordinate the activities of the other body systems. In addition to this, the nervous system senses (stimuli processing) and reacts to (integration of the changes) the world around; stores, organizes and retrieves past experiences (learning and memory) (Bloom & Lazerson, 1988; Van de Graaff, 1998).

2.2.2 The Organization of the Nervous System

The two operating divisions of the nervous system are: (a) the central nervous system (CNS), consisting of the brain and the spinal cord, which is contained within the body compartments formed by the skull and the spinal column;

and (b) the peripheral nervous system (PNS), which includes the cranial nerves arising from the brain and the spinal nerves arising from the spinal cord, along with two other functional subdivisions –the autonomic nervous system (ANS) which regulates the activity of the internal organs, and the sensory-somatic nervous system which is responsible for sensing and responding to the external world (Bloom & Lazerson, 1988)

Although specific connections exist between the specific parts of the nervous system, the parts of each system can best be understood in terms of a hierarchy. That is, as information is processed through the hierarchy, it goes from lower levels, such as those in the peripheral nervous system and the spinal cord, to higher levels, such as those in the cerebral cortex (Bloom & Lazerson, 1988).

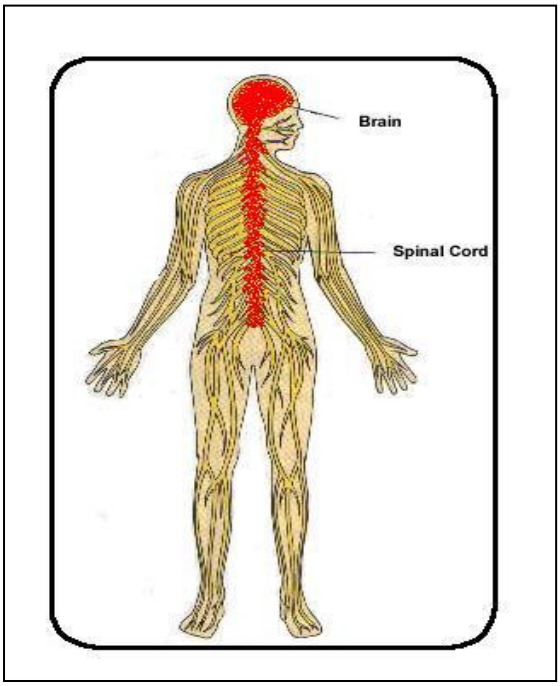

Figure 7. CNS and PNS throughout the body
(adapted from: http://users.tpg.com.au/users/amcgann/body/nervous.html)

Figure 7 above shows the distribution of CNS and PNS throughout the body. Areas involved in CNS are in red, while the areas involved in PNS are in yellow.

The central nervous system (CNS) is composed of the brain and the spinal cord. The structure and the functioning of the brain have been examined in the section on the parts of the brain and their functions. As for the spinal cord, it consists of centrally located gray matter involved in reflexes, and peripherally located ascending and descending tracts of white matter that conduct impulses to and from the brain. Ascending tracts conduct impulses from the peripheral sensory receptors of the body to the brain, while descending tracts conduct impulses from the brain to the muscles and glands. In addition, spinal nerves allow for reflexive movements (rather than those initiated voluntarily by the brain) such as the control of heart rate, breathing rate, blood pressure, swallowing, etc. (Van de Graaff, 1998).

The autonomic nervous system (ANS), as a functional subdivision of the nervous system, helps to maintain a state of dynamic constancy in the internal environment (homeostasis -the body's tendency to maintain a relatively unchanging internal environment regardless of the external changes-), together with the effects of the hormones (Van de Graaff, 1998).

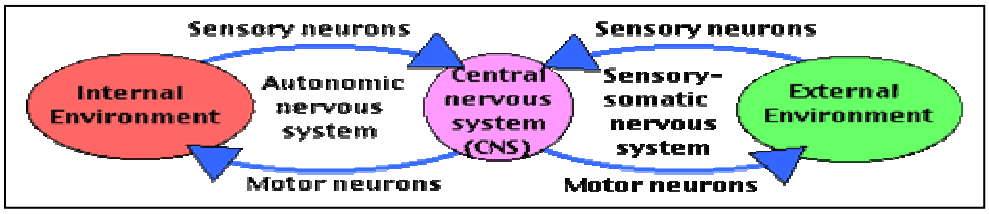

Figure 8. CNS, ANS, and sensory-somatic nervous system
(adapted from: http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/P/PNS.html)

The diagram in Figure 8 above summarizes the interrelationships between the central nervous system, autonomic nervous system, and the sensory-somatic nervous system.

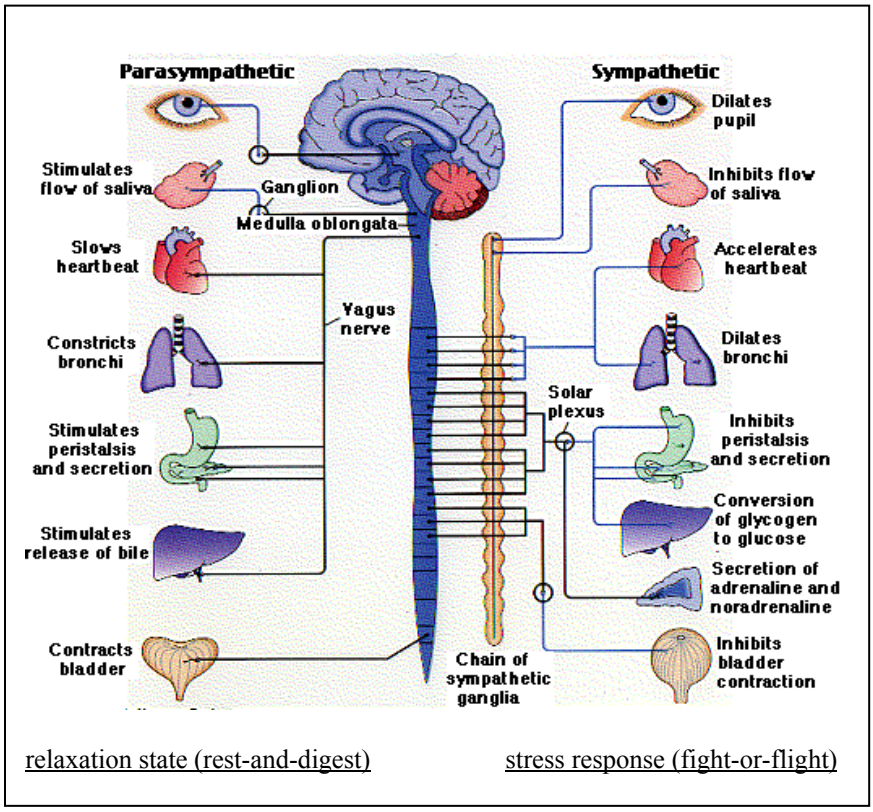

Figure 9. The sympathetic and the parasympathetic nervous systems (adapted from: http://www.driesen.com/autonomic_nervous_system.htm)

The controlling centers of the ANS are located within the brain, and these centers are influenced by higher brain areas as well as by sensory input. The major region that regulates the activities of the ANS is the medulla oblongata in the brain stem. This region is affected by both sensory input and the input from the hypothalamus which is already influenced by the input from the limbic system, the cerebellum and the cerebrum, and which orchestrates somatic, autonomic and endocrine responses during various behavioral states. All these interconnections

provide an autonomic component to the changes in body position, emotion and various expressions of personality, perception, and interpretation of information (Van de Graaff, 1998).

The peripheral portions of the ANS are subdivided into two complementary and antagonistic subdivisions: the sympathetic and the parasympathetic nervous systems (see Figure 9 above).

The sympathetic division prepares the body for intense physical activity through adrenergic effects in emergencies (fight-or-flight response) mediated by the neurotransmitters epinephrine (adrenaline) and norepinephrine (noradrenaline), resulting in an increase in heart rate and blood pressure, and a diversion in blood flow from the visceral organs (including the lungs -the principal organ of respiration, the heart -the principal organ of circulation, the stomach, small and large intestines, the liver, and the pancreas –the principal organs of digestion) and the skin to the skeletal muscles. On the other hand, the parasympathetic acts in many ways opposite the sympathetic division, and conserves and restores the body's energy through cholinergic effects mediated by the neurotransmitter acetylcholine , slowing down the heartbeat, lowering the blood pressure, and increasing the blood from the skeletal muscles to the visceral organs and skin (Van de Graaff, 1998). (The activities of the sympathetic nervous system are explained in 2.3.2)

The sensory-somatic nervous system, as a functional division of the nervous system, is responsible for sensing the external world (sensory systems) and moving through it (motor systems). Since our lives depend on our success in sensing the world through which we move and on the accuracy with which our sensations guide

our movements, we move away from threatening stimuli and toward comfort and protection (Bloom & Lazerson, 1988).

External stimuli are detected by the peripheral receptors (sensory neurons), they are processed and separated out in the primary sensory cortical areas in the brain. Then, they are recombined in the association cortex (occupying the greatest portions of each lobe and concerned with memory, emotions, reasoning, will, judgment and personality traits and intelligence (Hannaford, 1995)) and the gnostic area (collecting information from all four lobes and located among the somesthetic, visual and auditory association areas, this common integrative area receives impulses of taste and smell, information from the thalamus and from the lower parts of the brainstem, and integrates all to form a common thought (Hannaford, 1995)) to provide the perception of the events in the world around us. In response to the sensory information, the motor system, with commands to move arising in the motor cortex and stimulating selected neurons in the spinal cord and the muscles to which they are connected, initiates the movement. Cerebellum and basal ganglia are the two important brain structures in coordinated and voluntary movements (Bloom & Lazerson, 1988).

2.2.3 The Endocrine System

The endocrine system functions in relation with the nervous system in regulating and integrating body processes and maintaining homeostasis. While the nervous system orients the body activities through the action of electrochemical impulses that are transmitted by means of neurons, resulting in rapid responses, the endocrine glands secrete chemical regulators called hormones that travel through the

bloodstream to their intended sites, which is quite a slow process (Van de Graaff, 1998). In addition, the secretion of the hormones is controlled by the feedback mechanisms in their target cells (This mechanism is explained in 2.3.2).

The nervous system and the endocrine system work in collaboration in autonomically controlling the functions of the body because certain brain structures with the help of the three glands in the cranial cavity stimulate or inhibit the release of hormones, and similarly, certain hormones may stimulate or inhibit the activation of the nervous system (Van de Graaff, 1998). (Various neurotransmitters and their functions in learning are explained in 2.3).

The endocrine glands are distributed all over the body: the pituitary gland, the hypothalamus, and the pineal gland are associated with the brain within the cranial cavity; the thyroid gland and parathyroid glands are located in the neck; the adrenal glands and pancreas are located within the abdominal region; the gonads (ovaries) of the female are located within the pelvic cavity, whereas the gonads (testes) of the male are located in the scrotum (Van de Graaff, 1998). However, because of their relevance to the happenings in the educational settings, only some pituitary hormones and the adrenal hormones will be examined in this section.

2.2.3.1 The Pituitary Hormones

The secretion of pituitary hormones is controlled by the hypothalamus, as well as the hormonal feedback mechanisms from their target cells.

ACTH (Adrenocorticotropic Hormone): The release of ACTH is controlled by a corticotropin-releasing hormone (CRH) produced in the hypothalamus. This stress-related substance is released when one experiences injury, pain, infections, or

other trauma (along with morphine-like substances called endorphin and enkephalin) to protect against excessive pain (Van de Graaff, 1998; Jensen, 1998). It also leads to the secretion of the cortisol hormone in the adrenal cortex.

ADH (Antidiuretic Hormone): Also called vasopressin, ADH' s release is controlled by the hypothalamus in response to changes in water concentration in the blood. It reduces water loss from kidneys and elevates blood pressure. This stress-related hormone is partially responsible for our aggression.

2.2.3.2 The Hormones of the Adrenal Glands

Each adrenal gland consists of an adrenal cortex and an adrenal medulla, and is positioned along the superior border of a kidney (Van de Graaff, 1998).

Cortisol (an important glucocorticoid), secreted from the adrenal cortex in response to stress, corrupts the immune system, inhibits the regeneration of connective tissues, kills the neurons and impairs memory formation (Van de Graaff, 1998; Jensen, 1998).

The adrenal medulla produces two closely related hormones: epinephrine (also known as adrenaline) and norepinephrine. The secretion of these hormones is initiated by the hypothalamus via the spinal cord in response to stress, fear, or excitement, and activation of the adrenal medulla prepares the body for greater physical performance – the fight or flight response, resulting in increased blood glucose, blood pressure, heart rate, breathing rate, mental alertness, and blood flow to skeletal muscles (Van de Graaff, 1998).

2.3 Relevant Brain Research Findings

2.3.1 Attention and Consciousness

Consciousness and attention are two important concepts in educational settings since as teachers we always try to maintain the students' attention at a continuous and high level and make sure that they are truly conscious of everything that takes place in the classroom. Therefore, this section aims to find answers for the following questions from a neuroscientific perspective:

1. What is consciousness?
2. What is attention?
3. What are the brain structures and neurotransmitters involved in the mediation of consciousness and attention?
4. Is it beneficial and brain-compatible to always keep attention at a continuous and high level?
5. What might be some possible attention-related brain-compatible implications for the educational settings?

2.3.1.1 Concepts of Attention and Consciousness and Relevant Educational Implications

While consciousness may at present lack definitional precision, it might be roughly explained as the condition that is turned off when one goes to sleep or is lost when one suffers severe blow to the head, and as the state of one's being aware of

his thoughts and behaviors, and his own mental and physical actions (Bloom & Lazerson, 1988).

To reveal the underlying mechanisms concerning the nature of consciousness, cognitive neuroscientists simply define the term as a property of the relation between a phenomenon and an observer who is consciously aware of it. As an extension of this definition, they propose several types of consciousness: sensory awareness (awareness of most of the sorts of the things we call stimuli like the states of the world, state-relevant sensations and hallucinations), generalized awareness (awareness of the inner states of the body like fatigue, comfort, anxiety, and of the temporal durations), metacognitive awareness (awareness of all sorts of things that are in the realm of one's own cognition like one's becoming aware of what he is thinking at that time), and conscious recall (one's becoming aware of the events that occurred earlier, which do not need to be prompted by current sensory experience) (Churchland & Forber, 1995). Acting on this typology, one can conclude that one or a multiple of these several states of awareness should be active at a time, whose underlying mechanisms might be overlapping, or interfering or strengthening each other's functioning. However, since the brain's highly distributed networks perform all sorts of recurrent nonlinear operation, it is very hard to describe what is happening where in a neat symbolic way (Churchland & Forber, 1995), which is actually what distinguishes humans from the electronic artifacts, hardening the job of the cognitive scientists who try to replicate and simulate the human brain. Moreover, there is this fact that every brain is structured and hardwired in a unique way; that is, "though the functions are all ultimately produced by the brain, they may be produced in different ways by different brains, and may be implemented quite

diffusely across the cortex" (Churchland & Forber, 1995, p. 1297). This suggests a very valuable implication for the educational settings revealing the fact that, in a state of consciousness, external states, internal states, past experiences and metacognitive abilities all interact in an untraceable manner and this interaction takes place differently in every person.

Gazzaniga, on the other hand, adds a new dimension to the discussion of the concept of consciousness by claiming that human beings have specialized systems that have evolved to enable human cognitive processes, and consciousness is the feelings humans have about their specialized capacities (Gazzaniga, 1995).

He further supports his view by elaborating on the hemispheric differences related with consciousness: conscious thought –which is comparatively slow, abstract and deals with only a few objects at a time (Churchland & Forber, 1995)- is realized by the left hemisphere which constantly and reflexively labels experiences, makes inferences and carries out other cognitive activities, while unconscious experience –which deals with the raw experience in such an unembellished and limited way by simply monitoring the world and with almost no feeling attachment- is realized by the right hemisphere (Gazzaniga, 1995). However, such a justification seems to be a counter argument for what he claims since humans are goal-directed (motivated) creatures and thus "what is processed unconsciously will depend on how pertinent it is to accomplish a goal" (Hirst, 1995, p.1309). Therefore, the right hemisphere –claimed to be the site for unconscious experience- cannot be monitoring the world in such a senseless and feelingless manner; otherwise, people would not be able to select what will emerge into consciousness to be processed at the highest and most abstract level. Actually, Gazzaniga's claim concerning the left

hemisphere's dominance on consciousness is rooted in his conclusion that since language plays a dominant role in the person's consciousness and it is mediated primarily in the left hemisphere, the left hemisphere determines consciousness. Although Gazzaniga's arguments are based on his experiments with split-brain patients (the person whose corpus callosum, the bridge of fibers connecting the right and left hemispheres and allowing them to cross-talk with each other, is severed), such conclusions appear to be quite misleading considering the design of his studies. For instance, in an experiment, Gazzaniga projects an emotionally arousing film clip to the right hemisphere of a female split-brain patient. In the clip, one man pushes another man off a balcony and then tosses a firebomb at him. After this movie, he asks the patient what she had just seen. In her response, she says, "I don't really know what I saw. I think I just saw a white flash." Then, when he asks how she feels emotionally, she says, "I don't really know why, but I' m kind of scared. I feel jumpy. I think maybe I don't like this room, or maybe it's you; you're getting me nervous" (Restak, 2000). In the experiment, the right hemisphere responds to the film clip, while the left hemisphere (which did not see the clip because of the disconnection between the two hemispheres) does not know why she feels nervous. Because Gazzaniga uses linguistic channels (speaking and listening) to get the patient's reflections and activates the left hemisphere (where the language faculty resides to a great extent and which did not see the clip), the patient, not being able to enter the consciousness of her right hemisphere because Gazzaniga directs her to verbal perception and expression, attempts to provide a plausible but false reason for her mood change. On the contrary, if the patient had been quite talented in drawing (thought to be a right-hemisphere skill) and Gazzaniga had directed her to drawing

instead of using language to express what she had seen, perhaps the patient would have had direct entrance to the consciousness of the right hemisphere and drawn exactly what she had seen. In such a case, it would have been possible to conclude that since drawing is the determinant of the consciousness and it is mediated primarily by the right hemisphere, the right hemisphere dominates consciousness. Just like Gazzaniga's proposal, this conclusion as to the location of consciousness in the brain would have been misleading as well. That is because each hemisphere seems to have a separate consciousness of its own in addition to the one wholistic consciousness both hemispheres have. Thus, perhaps, a more holistic view in defining the concept of consciousness would be more appropriate in this context, rejecting a feeling-related hemispheric differentiation because conscious and unconscious processes always interact and emotions are active in both processes determining what will move from unconscious to the conscious. In fact, we respond to most of the events and people around us without thinking consciously about them; in other words, we learn to automate frequently practiced routines and these hidden mental processes regularly exert an influence on our behavior (Restak, 2000). Moreover, the association cortex (the large areas of the cerebral cortex not committed to processing specific sensory or motor information) creates consciousness by first integrating primary sensory information from all the senses (which is not necessarily a conscious experience) and then further integrating them with emotions, memories, and other cognitive skills (Bloom & Lazerson, 1988).

In the light of this discussion as to the nature and definition of the consciousness despite the fact that there is no clear-cut explanation for it, one concludes that in order for someone to pay attention to something first he must be

conscious of its presence. However, to maintain attention, it is not enough to be aware of what is present because proper attentional functioning depends on the suppression of irrelevant data and the amplification of relevant data, and what is relevant seems to be determined based on the question whether the data promote survival and/or extend pleasurable states, and this idea of relevance greatly influences the whole process of attention which is composed of the stages of alarm, orientation, identification, and decision (Jensen, 1998). Therefore, if one trades off attention to one message for attention to another (because he cannot hold on to many things at a time), this happens as a result of a conscious decision (Hirst, 1995); that is, the new message is more pleasurable and/or more vital for this person. In addition, the new message should involve some kind of suddenness (surprise effect), loudness, contrast, or novelty to be able to be amplified, suppressing the other competing messages, and excite the reticular formation.

However, this shift or decline in attention may also be due to the natural attentional highs (arousal cycle) and lows (rest cycle) of the brain throughout the day. In other words, the brain shifts its cognitive abilities on these high and low cycles (each lasting about 90-110 minutes) alternating between the verbal skills (in the left-hemisphere dominance) and the spatial skills (in the right hemisphere dominance) (Jensen, 1998). The application of this brain fact to the educational settings would be providing a variety of activities including the ones that exploit the potential of the right hemisphere and require intuition, insight, creativity, holistic thinking and imagination, and using process-oriented testing like portfolios and observation to gain a true understanding of the student achievement.

Moreover, the studies suggest that "genuine external attention can be sustained at a high and constant level for only a short time, around 10 minutes," and one must go internal and give up that external attention (so that he does not have to respond to other competing stimuli) to fully process and consolidate what he paid attention to (Jensen, 1998, pp. 45-6). Such breaks for association and consolidation are called the processing/down time, and every focused learning time should be followed by diffused activities like reflection, a nap, drawing, and writing, and the critical ingredient to downtime or personal processing time is choice (Jensen, 1998). In addition, the amount and frequency of the processing time depends on the difficulty of the material and the background of the learner: every 10/15-minute learning needs to be followed by 2/5-minute processing time when the novice learners are presented with unfamiliar content, while every 20-minute learning needs to be followed by a 1/2-minute processing time when the experienced learners are presented with familiar content (revision) (Jensen, 1998). Thus, it is counter productive and unrealistic to always keep students' attention at a high and continuous level because this ignores the fact about attention span and the shifts of brain cycles.

In order to better understand the fluctuations in the level of attention and fine-tune the flow of lessons (or the teaching/learning process) accordingly, one must first gain an understanding of the different brain-wave patterns occurring due to the changes in the electrical activity continuously generated by the neurons within the cerebral cortex. There are four main brain-wave states:

1. Beta waves, having a frequency of 13-25 cycles/second, are recorded from the frontal lobes and sensory-evoked. They respond to visual and mental

activity. In terms of the classroom applications, these are high activity times like debate, exercise, complex project and competition (Van de Graaff, 1998; Jensen, 1998).

2. Alpha waves, having a frequency of 10-12 cycles/second, are emitted from the parietal and occipital lobes. This provides a state of relaxed alertness and best for activities like reading, writing, watching, and problem-solving in terms of the classroom applications (Van de Graaff, 1998; Jensen, 1998).
3. Theta waves, having a frequency of 5-8 cycles/second, are recorded from the temporal and occipital lobes. This drowsy state is best for the processing time (Van de Graaff, 1998; Jensen, 1998).
4. Delta waves, having a frequency of 1-5 cycles/second, are recorded as a general pattern of the cerebral cortex during deep sleep, and this is a state of unconsciousness (Van de Graaff, 1998).

2.3.1.2 Related Brain Structures and Neurotransmitters

As to the brain structures and neurotransmitters involved in the mediation of consciousness and attention, it is seen that attention is carried out by networks of different brain areas, not the property of a single brain area (Posner, 1995). Whenever one has to focus and concentrate his attention, the anterior cingulate is activated, and its activity, in interaction with the hippocampus (for memories) and the frontal and the prefrontal lobes, is greatest during times that require thought; however, as things become routine, the activation of the anterior cingulate is reduced (Restak, 2000). In addition, while shifting attention, the posterior parietal lobe (in

disengaging attention from its present focus), the midbrain areas (in moving the index of attention to the area of the target), and the pulvinar –a thalamic nuclei- (in restricting input to the indexed area) are involved (Posner, 1995). Moreover, some neurons in the reticular formation in the pons greatly increase their firing rate in the waking state, sending elaborate projections upward to the hypothalamus, the midbrain, and the cerebral cortex, and downward to the spinal cord (Bloom & Lazerson, 1988), and within the reticular formation, certain neurotransmitters such as the norepinephrine, serotonin, and acetylcholin are produced and transported (Restak, 2000), which makes the person think logically, organize thoughts and process data. Besides, the alert state is maintained by the right frontal lobe (Posner, 1995). Thus, it is appropriate to involve movement-related and creativity-seeking activities to increase alertness by activating the reticular formation and the right frontal lobe.

In addition, the neurotransmitter systems are simultaneously active in varying degrees to optimize the processing capacity and facilitate the response output: the noradrenergic system seems to help maintain discriminability in stressful and arousing circumstances, the dopaminergic system plays a role in the activation of output, the cholinergic system appears to enhance stimulus processing at the cortical level, and the serotonin system serves to dampen the actions of each of others (Everitt & Robbins, 1995).

As a result, the chemicals also play an important role in attention, indicating that the brain is biological, far from being an electronic artifact, and every move one makes starts a chemical feedback-loop in terms of the fluctuations in the release of

various neurotransmitters resulting in the modification of the level and nature of attention.

2.3.2 Motivation, Stress and Emotions

In traditional educational settings in which the sole aim is the mere transmission of knowledge, teachers try to do the teaching without considering whether the learners are motivated, or whether the physical environment, the content and the teaching/learning process are non-threatening or emotionally appealing for the learners. However, today, through the findings of neuroscientists and psychologists, it is well documented that there is no separation of mind and emotions. Furthermore, emotions, thinking and learning are all linked, and, as Damasio suggests, emotion is always in the loop of reason (1994, as cited in Restak, 2000); thus, emotions should have an important place in learning and in schools. As a result, this section aims to find answers for the following questions:

1. What is motivation?
2. What is stress?
3. What is emotion?
4. What are the brain structures and neurotransmitters involved in the mediation of motivation, stress, and emotions?
5. Is it possible to separate emotions from thought and do teaching without the engagement of emotions?
6. What might be some possible emotion-compatible implications for the educational settings?

2.3.2.1 Definition of the Concepts and Relevant Educational Implications

Psychologists generally define motivation as a hypothetical state that is inferred from goal-directed behavior, and define emotional behavior as a means for a creature to communicate his motivational state (Bloom & Lazerson, 1988). Especially, for the human being, the goal has an incentive value because he expects that attainment of the goal will produce some positive emotion or at least reduce some negative emotion. In simpler terms, motivation is action in pursuit of a goal, while emotion is action resulting from situations that enhance or threaten that goal (Howard, 2000). However, if the conditions threaten the person's attainment of the goal, stress emerges. In more specific terms, stress may be defined as a reaction and accompanying emotions that result from the desire to terminate, escape from, or avoid a real or imaginary, current or imminent, negatively reinforcing event. Thus, stress, caused and accompanied by the emotions of fear and anxiety, interferes further with the person's attainment of the goal (Howard, 2000). After this brief introduction to the definitions of motivation, stress and emotion, the following part focuses on each term in greater detail.

To begin with, the kind of motivation desired in brain-compatible classrooms is of an intrinsic type (the person has a natural inner drive to search and subsequently to construct meaning) because complex real-life tasks (requiring analysis, synthesis, evaluation, problem-solving, decision-making) are valued over simple, short-term, reward-oriented tasks (arousing extrinsic motivation) in such settings. Although 50 percent of the variance in motivation can be accounted for by

our genetic inheritance (Howard, 2000), we can try to uncover the learners' intrinsic motivation by applying the strategies proposed by Jensen (1998):

1. Setting goals: Learners should set their own goals on a daily basis with clear and valid justification for their choices, and they should be provided with contexts for novelty, curiosity and relevance and be responsible for their own meaning-making.
2. Eliminating threats: Emergent problems should be dealt with through negotiation. Besides, the tasks should be manageable, involving breaks for process/down time and smooth transitions among the learning episodes.
3. Activating and engaging positive and productive emotions: Teachers should manage the learner emotions through drama, music, art, celebrations, games, and rituals.
4. Creating a strongly positive climate: Teachers should help learners to develop and maintain positive beliefs about themselves and the learning. This involves informing them about the progress they make, the use of positive posters and affirmations, and rituals.
5. Increasing feedback: Learners should be provided with multiple sources of feedback: teacher feedback, peer feedback, family feedback, computer feedback, self-evaluation, rubrics, and checklists.

With the application of these strategies, teachers can help learners get intrinsically motivated because the learners can realize that everything they say and do in this setting is compatible with their personality traits, talents, special abilities, values and beliefs.

Moreover, a motivated person functions optimally in physiological terms. That is, there is (Howard, 2000):

1. optimal functioning of the immune system,
2. optimal functioning of the cerebral cortex (cortical alertness),
3. moderate activation of the limbic system (moderate stress),
4. effective functioning of the "pleasure center" of the brain (that is, working like a personal trainer, the limbic system ordinarily rewards the cerebral learning with the release of the neurotransmitter dopamine from the top of the brain stem, which is also known as the hypothalamic reward system (Jensen, 1998).

On the other hand, when the educational setting lacks motivational appropriacy, and further, when learners are faced with threatening conditions, they get stressed. When stress occurs, the body prepares for one of the three responses: freeze, fight, or flee (Howard, 2000). Firstly, the amygdala, the brain region involved with the responses related with fear and threats, focuses the attention and receives direct inputs from the thalamus, sensory cortex, hippocampus, and frontal lobes. Actually, there are basically two parallel pathways to the amygdala, "low" and "high" roads that relay information from the outside world: the "low" one leads from the thalamus providing quite crude representations, while the "high" one leads from the periphery to the thalamus, to the cortex and finally to the amygdala allowing for elaboration and meaning (Restak, 2000). Then, neural projections from the amygdala stimulate the posterior hypothalamus causing the release of CRF (corticotropin releasing factor), which results in the secretion of the ACTH (adrenocorticotropin) from the pituitary gland. Then, the ACTH excites the

sympathetic nervous system, causing the secretion of the cortisol from the adrenal glands, which triggers a string of physical reactions such as stimulating the formation of epinephrine and norepinephrine, sensitizing the adrenergic receptors, inhibiting the breakdown of epinephrine and norepinephrine, increasing fat and glucose breakdown, tensing large muscles, increasing blood pressure, and stimulating the reticular activating system (Howard, 2000; Jensen, 1998). This is basically the stress response.

Chronically high levels of cortisol lead to the death of brain cells in the hippocampus –a cortical area involved in explicit memory formation and initial coding of new information necessary for learning and memory, and the impairment of the person's ability to sort out what is important and unimportant; in addition, lower levels of self-esteem caused by stress results in lower levels of serotonin, which leads to violent and aggressive behaviors (Jensen, 1998; Restak, 2000).

Another important point about the amygdala is that this region is programmed to react without benefit of input from the cortex (using only the "low" pathway leading directly from the thalamus); thus, the emotional responses can occur without the involvement of the higher processing systems believed to be involved in thinking, reasoning, and consciousness (Restak, 2000). For instance, an emotional reaction like fear can more easily gain control over the cortex and influence cortical processes than the cortex can gain control over the amygdala (Restak, 2000). This is because there are far more neural fibers from the amygdala up into the cortical areas than the reverse (Sylwester, 2001). However, a person can follow the "high" cortical pathways by involving the prefrontal cortex and the somato-sensory cortex along with the limbic structures and modify his stress/

emotional responses. This is due to the fact that he becomes flexible in his emotional reactions based on his interactions with the internal and external environments since he realizes the connection between the stressor (the source causing stress) and the resulting physiological states (stressed body) (Damasio, 1994).

Then, what happens if it is not just a temporary threatening state such as a deadline the person is rushing to meet (causing acute/immediate stress response mediated by the hypothalamic-sympathetic-adrenomedullary axis as mediated by the epinephrine and norepinephrine), but a chronic condition such as the stress of being trapped in a despised job or career?

Such a case, causing chronic/long-lasting stress response mediated by the hypothalamic-pituitary-adrenocortical axis, results in decreased glucose utilization all over the body, reduction in cellular protein in all tissues except the liver, and increased mobilization of fatty acids; slows down overall growth and development; and causes energy depletion, depression, anxiety, hopelessness, impotence, emotional withdrawal, confusion, chronic fatigue, lack of concentration, and poor memory (Howard, 2000). This is the condition in which the learner experimentally learns that he has no control over his environment and thus gives up trying to exert control. This state in which the person demonstrates almost complete apathy and persistent passivity is called learned helplessness (Howard, 2000; Jensen, 1998).

The learner who has learned to be helpless has a tendency to evaluate his success as external (that is, someone else made it happen), temporary (that is, it will not happen again), and limited (that is, it will not affect any other area of his life), whereas he has a tendency to evaluate his failure as internal (that is, it is his own fault), permanent (that is, it will last forever), and universal/pervasive (that is, it will

affect every area of his life) (Howard, 2000). In order for such learners to become mobilized again and for their brains to rewire themselves to change the behavior of helplessness into optimism, teachers should help the learners acquire stress management techniques such as time management, breathing, process/down time, relationship skills, getting peer support, physical exercise and movement, and encourage them to set specific and realistic goals and to see the connections between their actions and their outcomes, and make use of drama, games, discussions and celebrations to create a positive and stimulating climate (Jensen, 1998).

On the other hand, some stress is not necessarily bad for learning, and low to moderate levels of stress are best for most learning conditions, helping the learners put together relationships, understand general underlying theories, and integrate a wider range of material (Jensen, 1998). The normal arousal (moderate stress) when acetylcholine, dopamine and serotonin are the active neurotransmitters is the best state for problem-solving and creativity, while the focused attention when the active neurotransmitter is testosterone is best for productivity and routinized behavior (Howard, 2000).

2.3.2.2 Emotions and their Biological Pathways in Relation to Educational Implications

After a detailed review of the concepts of motivation and stress, and thus making an introduction into the world of emotions, in this part, it would be appropriate to further analyze the emotions and various emotional states. Although emotion has been simply defined as an action resulting from situations that enhance or threaten a goal by Howard (2000), the term finds its exact place in the literature

by Sylwester' s explanation; that is, emotion, centered principally in a small set of subcortical brain systems, is our biological thermostat to determine when a specific challenge (danger or opportunity) reaches the threshold of being sufficiently important to activate the several systems that focus attention and develop appropriate responses, and so, it is central to cognition (and educational practice) (Sylwester, 2001).

According to Sylwester (2001), emotions, being neither positive nor negative as they all evolved to alert us to specific kinds of problems and are all developmentally important, are innate, powerful and unconscious processes that tend to respond to high contrast information and to monitor/ ignore steady states and subtle changes. Our primary emotions are surprise, happiness, fear, anger, disgust, and sadness, while the secondary/ social ones are embarrassment, jealousy, and guilt (Sylwester, 2001).

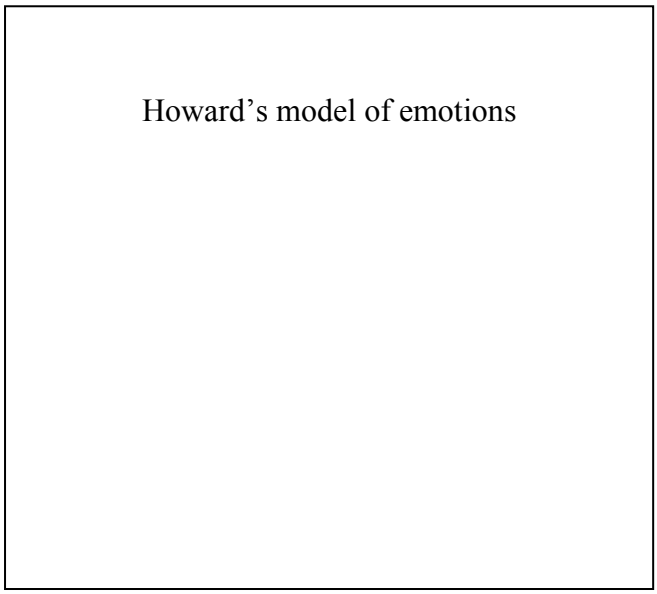

Figure 10. Howard's circumplex model of emotions

Furthermore, Bloom and Lazerson (1988) theorize that in order to experience an emotion, both physiological arousal and cognitive evaluation must be present, and neither alone can produce a true emotional state. The same theory is represented in the "circumplex model" about emotions by Howard (2000). This model locates each of the emotions on an x-y coordinate system based on two dimensions: evaluation (pleasant versus unpleasant), and level of arousal (alertness versus sleepiness) (see Figure 10 above).

As to the chemistry of emotions, peptides –chains of amino acids composing protein, which is the basis for all life- are the biochemical basis for emotion in the body (Pert, 1997). Peptides, being the informational substances residing not only in the brain but all over the body, allow the brain to communicate with the body in the effort to maintain homeostasis. This happens through a feedback loop between the cells signaling each other through the release of neuropeptides which bind with their receptors. The signaled cells respond by making physiological changes and feed back information to the peptide-secreting cells, telling them how much less or more of a peptide to produce (Pert, 1997). There are peptide receptors all over the body: the hippocampus, the organs, tissues, skin, muscles, and endocrine glands, which indicates that emotional information is stored in many places in the body, not just the brain; therefore, you can access emotional memory anywhere in the peptide/receptor network, in any number of ways (Pert, 1997).

Peptides being the biological basis for the emotion also explains how each emotion has its unique physiological responses such as anxiety's causing an increase in blood pressure, or fear's leading to the narrowing of the blood vessels. Actually, the physiological responses (cardiovascular, musculoskeletal, thermoregulatory,

respiratory, gastrointestinal, urinary, and reproductive) to negative emotions can result in related disorders such as headache, stomach pain, blushing, sweating, and muscular tightness (Howard, 2000).

As language teachers, we need to consider the critical influence of emotions on learning since they are the gatekeepers to performance in Pert's terms. Everything we experience has an emotional tone to it and emotions mediate our meaning because emotions are the framework for our day and they are an accumulation of learned wisdom since all survival lessons of life are emotionally hardwired into our DNA (Pert, 1997). This is due to certain facts about emotions as documented by Jensen (1998):

1. Emotions have their own biologically automated pathways, which are the superhighways of the brain. Response to emotion occurs before response to thinking.
2. The chemicals produced by emotions are dispersed throughout the brain and body and linger to strongly influence our behaviour and capacity to learn.
3. Emotions are a critical source of motivation. We use thinking to plan and set goals but emotions supply the energy and drive to accomplish them. Whenever we reduce fear and threat, students learn more successfully.

Since emotions drive attention, index events, set priorities and create meaning, memories associated with emotions -especially traumatic and pleasurable events- are enhanced; and as language teachers, we should consider the importance of positive emotions in the long-term memory potentiation since the emotions form one type of implicit memory. That is, good learning does not avoid but embrace

emotions. Jensen presents some practical suggestions such as role modelling (modelling a love of learning and enthusiasm about your job), celebrations (using parties, food, music, fun), a controversy (introducing a debate, dialogue, or an argument), physical rituals (such as clapping patterns, movements), introspection (using journals, stories, sharing, reflection about personal issues), and plays and games to enhance the quality of a learner's consciousness (Jensen, 1998).

In terms of the brain structures involved in the mediation of emotions, a number of structures in the brain stem (involving the reticular formation, the locus coerulus within the pons, the substantia nigra in the midbrain), the limbic system, the parts of the cortex (involving the frontal lobes), and the neural pathways that connect them to each other and to other parts of the brain and the nervous system all function in producing emotions (Bloom & Lazerson, 1988).

Firstly, the reticular formation within the brain stem receives sensory information through various neural pathways and acts as a kind of filter, passing on only information that is novel and persistent (Bloom & Lazerson, 1988). Different from the neurons in primary sensory pathways, the neurons in the reticular formation are nonspecific; that is, they can respond to information from many sources. Thus, these neurons pass along messages from the eyes, the skin, and the viscera, among other organs and structures, to the limbic system and the cortex (Bloom & Lazerson, 1988). In addition, in the pons, the locus coerulus whose neural pathways travel up into parts of the thalamus and hypothalamus and many parts of the cortex secretes the neurotransmitter norepinephrine, which triggers emotional arousal (At very low levels, it causes depression, while at very high levels, it causes severe stress reactions. It also plays a role in the experience of pleasure). Besides, in

the midbrain, the substantia nigra secretes the neurotransmitter dopamine which facilitates some pleasurable sensations and mediates exhilaration (Dopamine depletion causes the deterioration of the neurons in the substantia nigra which inhibits forced involuntary movements, while at excessive amounts it causes schizophrenialike behaviors.) (Bloom & Lazerson, 1988).

Then, incoming messages from all the senses, after traveling through the pathways in the brainstem, the various processing levels in the cortex, or both, pass through one or more of the limbic structures: the amygdala, the hippocampus, or part of the hypothalamus. Outgoing messages also pass through these structures (Bloom & Lazerson, 1988). Therefore, all our interactions with our environment have an emotional coloring of some kind.

Furthermore, in the limbic system, the hypothalamus has neurons that effect changes in the autonomic nervous system that accompany strong emotions. Specifically, the stimulation of the posterior hypothalamus excites the sympathetic nervous system (the fight-or-flight), while the stimulation of the anterior hypothalamus excites the parasympathetic nervous system (the relaxation reponse) (Howard, 2000). Besides, the amygdala is active in the production of aggressive behavior or fear reactions. Also, there is a two-way fiber system, called fornix, connecting the hippocampus to the hypothalamus. Another structure, the septum, receives neural input through the fornix from the hippocampus and sends neural output to the thalamus (Bloom & Lazerson, 1988).

As for the cortical structures, the frontal lobes, which receive direct neural projections from the thalamus, appear to be the parts most involved in emotion. This is due to the fact that the frontal lobes are important in temper and personality,

which has been known since a 25-year-old patient Phineas Gage showed profound personality and temper changes (He turned out to be restless, loud, profane, and impulsive, while he had been dependable, industrious, and well-liked before the accident.) after the removal of his left frontal lobe (Bloom & Lazerson, 1988). Besides, studying patients with brain damage that had severed the frontal reasoning area from the amygdala' s emotional resources, Damasio revealed that these patients performed normally on traditional intelligence tests but were unable to plan, make rational decisions, and anticipate future pain or pleasure in connection with specific alternatives (1994, as cited in Howard, 2000). This suggests that rational decision making and planning cannot occur without access to the emotions. Moreover, the frontal structures are associated with the emotional expression, and the posterior cerebral structures within the right hemisphere are associated with the emotional perception. In addition, while the left frontal lobe houses positive and negative emotional processes, the right frontal lobe houses only negative processes (Howard, 2000). As for the other structures in the cortex, damage to the parietal, temporal, or occipital lobes results in no apparent change in emotional activity (Howard, 2000).

Consequently, as Pert puts forward, raw emotion collected from the periphery wants to move up to the brain, to the consciousness and get integrated passing through the spinal cord and the lower areas of the brain. By this way, the person becomes conscious of this unconscious, raw emotional arousal (to a potential danger/opportunity), and at that time the feelings emerge in the brain. Thus, different from the unconscious emotions, these conscious feelings allow the person to go beyond innate programmed behaviors to rationally design solutions to a variety of contemporary challenges that evolutionary development did not cover, as

Damasio suggests (1994, as cited in Sylwester, 2001). According to Damasio, the biology of consciousness follows a three-step process. The first one is the protoself; that is, consciousness begins with a neuronal arrangement that maps every part of an organism's body into one of various interconnected areas (e.g., a collection of automated brain systems realizes circulation) (Sylwester, 2001). Then, in addition to a map of its body, a conscious brain contains a mechanism for mapping and connecting to the external world. This is called the core consciousness and it refers to the consciousness of here-and-now and non-verbal imaged accounts of the objects an organism confronts and moves through (Sylwester, 2001). Finally, organisms must also have a large cortex in order to consciously move beyond the here-and-now to profit from past experiences and to avoid potential problems, which is called the extended consciousness (Sylwester, 2001). This is roughly how the conscious processes (feelings) would have evolved in our brain out of the unconscious systems that regulate emotion according to Damasio. However, the cortex has a tendency to prevent the integration of the raw emotion by pushing this energy down. If the emotions cannot be expressed and collect in the body, the receptor sites on the cells for particular peptides will be disrupted or close down (Pert, 1997). Pert suggests some relaxation techniques to release these emotional residues from the body such as keeping a dream journal, detachment, humor, etc.

With this recognition of the importance of emotions on brain and body functions, there emerged a concept called emotional intelligence. Emotional intelligence can be simply defined as emotional self-management. The scope and the components of this intelligence are described by Salovey and Goleman in their five-part model of emotional intelligence (1995, as cited in Howard, 2000). This model

presents emotion as a process that moves from an event through appraisal to coping. The first element is self-awareness, which is the ability to monitor one's own feelings and appraise their significance consciously or unconsciously. The second element is self-management, which is the ability to handle one's own feelings in such a way that they do not disrupt one's life (conscious planning of how to cope). The third element is self-motivation, which is the ability to remain in the "flow" state (one's way of manipulating the events in coping with respect to his personal resources). In this state, the person is so involved with the activity in hand that nothing else seems to matter. The fourth element is other awareness, which is the awareness of emotions in others and empathy for them. The fifth element is relationship management, which is the social competence that enables one to interact smoothly with others. Overall, the first three elements reflect the features of the intrapersonal intelligence, while the latter two elements demonstrate the features of the interpersonal intelligence, in Gardner's terms.

In conclusion, Goleman's model provides a valuable framework for learning, teaching, and modeling the emotional intelligence. Moreover, the learners should be presented with the concept of emotional intelligence and the education in emotional self-management should be a high priority.

2.3.3 Meaning Making, Memory Formation and Recall

2.3.3.1 The Process of Meaning-Making and Its Educational Implications

Based on commonsense knowledge and daily experiences, it can be concluded that we remember what we thoroughly understand; we understand what

we specifically pay attention to; and we pay attention to what we intrinsically want; in other words, "experience arouses emotion, which fixes attention and leads to understanding and insight, which results in memory." (Howard, 2000). Thus, if one wants to remember something, he must stop and pay attention to it, avoiding other competing distractors. This suggests that the exploration for meaning is very intrinsically motivating (Jensen, 1998), and in order for the memory of a newly presented material to be formed, learners need to make their own meaning out of the material as it is presented.

Primarily, the critical factor to meaning-making is intention, or emotion more clearly. This is due to the fact that when we evaluate events, people, and things, we are actually attaching feelings to them. As emotions involve our goals, beliefs, biases, and expectations, they engage meaning and predict future learning (Jensen, 1998). So, to ease the learners' attainment of meaning, teachers should purposely provide opportunities for the expression and engagement of emotions through activities such as roleplay, drama, improvisation, dance, stretching, music, guest speakers, journal writing, collaboration, team/pair work, and novelty and curiosity seeking activies (Jensen, 1998).

As the second factor, the learners need to be able to form personal connections with the newly presented material by linking the new material to prior learning (Jensen, 1998). Thus, new learning should, in some way, be relevant to the learners and their lives. A closely related third factor that is critical to the formation of meaning is pattern-making. Studies suggest that people have an innate desire to form some kind of meaningful pattern out of learning (Jensen, 1998). Being processed in interaction with the concept of relevance, pattern-making involves the

organization and association of new information with previously developed mental hooks. The underlying idea here is closely related with the well-known schema theory (mental maps), which suggests that the new material is perceived and related to the relevant established entities in the cognitive structure and becomes an integral part of the previous categories or networks as put forward by Ausubel (as cited in Brown, 1994). Therefore, in the meaning-making process, it is his existing schemas that tend to determine how a learner evaluates and molds new information unless he works hard to establish new schemas. Besides, studies indicate that when learners can relate new concepts structurally to familiar situations, or schemas, they demonstrate greater understanding and retention (Howard, 2000). However, the formation of new schemas is required when it is not possible to accommodate new experiences to old schemas (Howard, 2000).

In such occasions, it is the instructor's responsibility to listen to the learners discuss their newfound knowledge and clarify instances of possible inappropriate accommodation to previous schemas. Moreover, the learners should be given time and chance to see the relevance of learning and link the new material to prior schemas with discussion, mapping, journaling, and sharing of current events (news), stories, legends, myths, metaphors (Jensen, 1998); in addition, the learning (information processing) needs to be experiential/narrative, a primarily right-brain process involving the learning of feelings and behaviours through schemas, as much as rational/expository, a primarily left-brain process involving the learning of attitudes and beliefs through language (Howard, 2000). It is also recommended that after learners demonstrate initial comprehension of the new material, the instruction should include variations, interference, distractions, and other difficulties in order to

make learners not be satisfied with just the material's surface/reference meaning, but explore its deeply felt meaning (Howard, 2000; Jensen, 1998).

Furthermore, the experience of meaning has a biological correlate as well. There is whole-brain functioning in meaning-making as it occurs in many areas of the brain: the frontal lobes function in optimism, making meaningful patterns and using context; the temporal lobes are active in relevance and the links with past experiences; the occipital lobe processes pattern-discovery and spatial order; the parietal lobe is active in insights and inspiration; and the midbrain (involving the thalamus, the amygdala, and the lower parietal areas) along with the frontal and the occipital lobes function in emotionally felt meaning, satisfaction, and pleasure (Jensen, 1998).

2.3.3.2 The Processes of Memory Formation and Recall and Their Educational Implications

When it comes to the formation of memory, it is appropriate to start with a definition of memory: it is simply the learning that sticks (Howard, 2000) since we assume that the students have learned something if they demonstrate recall of it (Jensen, 1998). Moreover, memory is not a single entity, or a fixed skill, or a location, but rather a process involving the creation of a persistent change in the brain by a transient stimulus, and composed of separate and multiple locations and systems (Jensen, 1998; Squire & Knowlton, 1995). Thus, scientists now view memory not as a fixed singular location but as a process which cannot be separated from retrieval (Math Matters, 1998). Certainly, many distinct locations of the brain are implicated with certain memories, for instance, memories of sound are stored in

the auditory cortex, and emotional memories are stored in the amygdala, and context-bound memories are stored in the temporal lobes (Jensen, 1998). Therefore, multiple memory locations and systems are responsible for our best learning and recall as proposed by Schacter (as cited in Jensen, 1998). Here, "best learning" refers to the meaningful learning in Ausubel's terms (as cited in Brown, 1994) or locale (natural) memory in Caine and Caine's terms (1991) as opposed to the rote learning (Ausubel) or taxon memory formation (Caine and Caine). If the learner feels relaxed and in control, the cortex is fully functional; and thus, higher-level, more meaningful learning is possible (such as creativity, analysis, synthesis, planning, problem-solving, complex decision-making); however, if the learner feels highly controlled, he downshifts from cortical locale learning to the limbic taxon learning (such as habits, instincts, and automatized behaviours) (Howard, 2000). When the learner can set his own goals, make use of his schemas and is presented with real-world applications, he can feel fully in control and avoid downshifting (when the person confronts threatening situations, the brain downshifts to lower brain areas because it is "emotionally hijacked" into the fight-or-flight mode (Goleman, 1995) and functions at the survival level, being unable to fulfill higher cortical functions).

After this brief definition of memory, the next part focuses on the memory formation process in a step by step fashion. Firstly, potential new learnings linger in the right prefrontal cortex. This "working memory" area can hold 7 +/- 2 bits of information at a time for two seconds or less (Howard, 2000). For a sensory stimulus to enter the conscious and attentive processing of the human working memory, it needs to possess at least one of the following features: sudden appearance, loudness,

contrast, novelty, and vitality as this memory area has a limited capacity (Karakaş, 1999). Such features are also critical in their relation to the concept of habituation – the state that our sensory receptors shut down from their aroused state if a new stimulus continues without variation in quality or quantity (Howard, 2000). By varying the stimulus (avoiding monotony), habituation and its accompanying inefficiency in learning can be prevented.

When the person experiences emotional arousal in response to the present stimulus (that is, when he decides to remember this information as a memory) and he is physiologically ready (that is, he is not exposed to fatigue, stress, or medication) to capture this information, C-kinease (a kind of protein) is released and settles around the newly formed synapse, thus forming the basis for memory (Howard, 2000). The hippocampus is the brain's entry point for this short-term memory to be formed (Restak, 2000), and this short-term memory can be held in this area for 5 to 20 seconds (Jensen, 1998). Actually, one can enhance the capacity of the short-term memory by making use of some mnemonic techniques (the exercise techniques which are used to make information easily retrievable) such as visualization (forming interesting and vivid mental images or scripts), association (phonetic or thematic), concentration, personalization, and close observation, all of which require strong intrinsic motivation on the part of the learner (Karakaş, 1999). Then, with subsequent recall and practice, the new connections get stronger (Howard, 2000), and the hippocampal cells expand the storage of the new learning to the cerebral cortex, where the long-term memory is stored and retrieved (Howard, 2000).

In addition, a key factor to the formation of the long-term memory is the level of neurotransmitters epinephrine and norepinephrine. That is, it is known that some level of emotional arousal (resulting in the release of epinephrine and norepinephrine into one's system from the adrenal medulla and extra production of glucose) is necessary to cause a memory to be fixed; however, if the emotional arousal is intense, it may interfere with memory formation (either putting it into background, or impairing important brain cells in the hippocampus) (Howard, 2000).

Furthermore, the long-term memory has a large capacity, and it includes both the directly registered information and the abstractions and interpretations based on that information involving causal, functional, temporal, episodic, and semantic representations, and each time a memory is triggered, the content of the long-term memory is imperceptibly updated and reconstructed in a continuous manner since it is a flexible, dynamic and selective process (Karakaş, 1999; Restak, 2000).

Due to such features, the formation of the long-term memories is the ultimate goal of the teaching/learning process. Howard (2000) recommends three critical strategies that help converting the short-term memory into the long-term memory: intend, file, and rehearse.

Firstly, the learner needs to make a point of wanting to remember the information (intend). For instance, if one is really interested in a course, he does all he can such as getting the outline and the reading list beforehand to get prepared to take the course. Second, the learner should organize and play with the information in his own unique way (file). For instance, to understand the relationships among various concepts, one can make flowcharts and diagrams, or he can use associations

and rhymes to learn new vocabulary items. Third, the learner needs to practice the information as a way of showing that he wants to remember it (rehearse). For example, to review the information, one can make a set of flashcards, or create an audiotape of the information to review it while doing some other activities like jogging, cooking, etc (Howard, 2000). It is also advised to repeat key ideas in the newly learned material within 10 minutes of the original learning, then 48 hours later, and then to tie it all 7 days later (Jensen, 1998).

Moreover, after a learning episode of around an hour, the learner needs to take a break. This break may appear in the form of an exercise like stretching, walking, climbing some stairs. Such a follow-up to a learning module is excellent because the new neural connections formed by the learning need this down/process time to fix and strengthen themselves without the competition from additional novel stimuli (Howard, 2000), and because the increased epinephrine levels caused by the physical activity have a positive impact on the new neural connections (Howard, 2000). In addition, it is very crucial to review the old material before going on to something new; and thus, the learners should be provided with opportunities for follow-up and follow-through tasks such as assignments, projects, writing scripts, and personal progress reports (Howard, 2000). It is also essential that learners should be required to review prior material both during the course and in subsequent courses. These would create valuable reflection occasions in which learners will review the familiar and new patterns in the materials, see the relationships between various topics from a holistic perspective, and make real-life connections. Transfer of learning also occurs when one is able to repeat a new behaviour in different kinds of situations that are remote in time (Howard, 2000).

Besides, the time at which one schedules his new learnings is also an important issue. This is because a person experiences optimum cortical alertness at one of three times: after first waking, shortly before sleeping, and approximately halfway in between. Therefore, the best times for new learnings might be between 8:30 a.m. and 13:30 p.m., or 16:30 p.m. and 21:00/22:00 p.m. The time between 13:00 p.m. and 16:00 p.m. is when one's cortical alertness is at its lowest level (Howard, 2000).

Finally, once a long-term memory has been formed, three major factors interfere with retrieving it: clogging at the synapse over time as protein particles accumulate on both sides of the synaptic gap (however, this clogging is removed by the neurotransmitter calpain, found in calcium), deterioration of the neural pathways involved (however, if not by aging, this deterioration can be controlled by the production of the neurotransmitter acetylcholine, found in dairy fat), and stress (Howard, 2000). But still, such problems can be avoided by proper nutrition and stress-management techniques.

Besides, it is proposed that one cannot separate memory and retrieval; that is, memory is determined by what kind of retrieval process is activated. When enough of the right type of neurons firing in the right way are stimulated, the learner can retrieve the appropriate memory (Jensen, 1998); otherwise, he fails to retain the required memory. This provides a very valuable insight for the educational settings: the testing situation should resemble the learning condition to ease the retrieval process for the learners. This idea is also suggested by the concept of state dependence which proposes that learners recall information more readily when they can remember the state in which they learned that information (Jensen, 1998: 102).

This state may involve place, mood, odors, and physical conditions. This is due to the fact that the synapses formed to create a specific memory are connected to neural networks that form the basis of the conditions associated with the time and place of learning (Howard, 2000). Therefore, when teaching job-related skills, for instance, the instructor should create a learning environment that approximates the conditions on the job, and develop as much spatial, temporal, sensory, and semantic detail as possible to maximize the credibility of the environment (Howard, 2000).

After this thorough analysis of the three steps of memory formation involving the working memory, short-term memory, and long-term memory, the following section focuses on the various types of memories. In a very broad sense, there are two kinds of memories: explicit/declarative memory –involving facts and events, flexible, applicable to novel contexts- and implicit/nondeclarative memory – inflexible, bound to the learning situation; that is, we know it, but we do not know that we know it- (Jensen, 1998; Squire & Knowlton, 1995).

Firstly, the explicit/declarative memories might be of two types: semantic and episodic memories. Semantic memory is word-based such as names, figures, facts and it is the most frequently used memory pathway in the second and foreign language classrooms (Christison, 2002). It requires strong intrinsic motivation on the part of the learner and best activated by novelty, similarities or contrasts. Therefore, recall is enhanced by many strong associations and the use of graphic organizers, mind-maps, rhymes, visualization, mnemonics, peg words, music and discussion (Jensen, 1998; Math Matters, 1998).

The other explicit memory is episodic and it is based on experiences, events, locations, memories in context. It has unlimited capacity, forms quickly and requires

no practice. It is enhanced by sensory input: sights, sounds, smells and movement. Recall is triggered by contextual cues such as locations and emotions (Math Matters, 1998).

In order to activate explicit memories, we have to consider that (Jensen, 1998):

1. we remember material best when it is structured and meaningful (but students should compose their own meaning out of confusion);
2. wholes taught before parts are recalled better;
3. we better recall material when we have reorganized it again and again (the importance of analysis and synthesis);
4. peer teaching and sharing works well;
5. there should be shifts of locations, circumstances, novel classroom positions.

On the other hand, the implicit/nondeclarative memories are procedural, reflexive, sensory conditioning and spatial. Procedural memory is motor memory or body learning, which means that some students remember hands-on learning best. This is supportive of the TPR (Total Physical Response) language-teaching model of Asher in which students do a lot of acting. As a result, some strategies like use of purposeful movement, roleplaying, dancing, team formation which enhance procedural memory should be employed (Math Matters, 1998).

Reflexive memory is full of automatic, instant associations; therefore, overlearning of material through rote practice can create reflexive memories. Reflexive learning is the goal, for instance, when using flashcards to teach

vocabulary items, but many students need associations and context to develop reliable retrieval of those vocabulary items; so, excessive reliance on solely reflexive memories leads to difficulty in recall (Math Matters, 1998).

Sensory conditioning is the memory based on specific sensory pathway; thus, linking memories to senses and providing sensory-specific cues for recall would be appropriate (Math Matters, 1998).

Spatial memory is the memory based on the surroundings and the context, and this brings the importance of forming mental maps into our minds and has strong connections with episodic memories (Math Matters, 1998).

Besides, since emotions drive attention, index events, set priorities and create meaning, memories associated with emotions, especially traumatic and pleasurable events, are enhanced. Therefore, we can actually conclude that emotions form one type of memory, and this emotional memory is of an implicit type (Jensen, 1998)

Finally, when we incorporate real-world context with its many associations, and hands-on exercises, students use the power of episodic and procedural memories as much as that of semantic and reflexive memories to improve recall because in such cases there is whole brain functioning (activation of the gnostic area in the brain, which is the integrative thinking area located among the somesthetic, auditory and visual association areas and receiving information from all lobes (Hannaford, 1995)).

As to the brain structures associated with memories, different brain areas are active in the formation and consolidation of different memories. Firstly, declarative memory is mainly a cortical process and is the product of the medial temporal lobe (the hippocampus, the entorhinal cortex, the parahippocampal cortex, and the

perirhinal cortex) and the diencephalon (Squire & Knowlton, 1998). Landscapes and patterns are related to the parietal lobes, and social encounters are linked to the frontal lobes (Restak, 2000).

As to the nondeclarative memories, the classical conditioning of discrete responses of the skeletal muscles depends on the cerebrum, the conditioning of emotional responses depends on the amygdala, the learning of habits and stimulus-response tasks depends on the hippocampal formation and the neostriatum (Squire & Knowlton, 1995).

2.4 Language Teaching

"The notion of a systematic set of teaching practices based on a particular theory of language and language learning," is what language teaching methodology is within a conceptual framework according to Rodgers (2001). In short, methodology is that which links theory and practice. To visually represent the interrelationships among the components of methodology and workings of the process of developing a methodology, Rodgers (2001) designed the following figure:

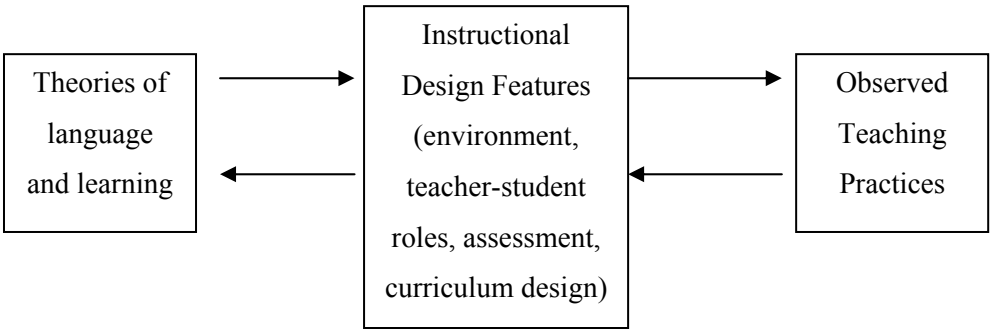

Figure 11. The process of developing a methodology

To begin with, it is well supported that language initiation is both a purposeful move and an instinctual behavior in first language acquisition settings (Pinker, 1994). That is, the person has an inner drive to understand and produce speech and language in order to attain his needs and be part of a society. Therefore, there is the thought/need preceding the emergence of language, and this is the point missed by the teachers who try to teach language deprived of context, patterns, meaning and relevance.

In addition, although thought/need initially calls for the emergence of language, in the further stages of development, language moulds the structure and complexity of the child's thinking, which is the essence of what Vygotsky (Ricardo, 2002) claimed in his speculations about the origins and the interdependent development of thought and language. As a result, while we are teaching a language, at the same time, we are teaching how to think and how to learn -explicitly or implicitly (both cognitive and metacognitive strategies).

Moreover, in line with such a philosophy concerning the functions of language, to define the kind of language/language proficiency that learners should develop, Cummins developed a taxonomy which classifies the language and content activities. Cummins (Glossary of Second and Primary Language Acquisition Terms) claimed that individuals develop two types of language proficiency: basic interpersonal language skills (BICS) and cognitive academic language proficiency (CALP) and that these two types of proficiency vary according to the degree of context available to the individual and the degree of cognitive challenge of the task. BICS skills are context-embedded and cognitively undemanding (such as social, situational language, daily exchanges), while CALP skills are context-reduced and

cognitively demanding (such as problem-solving, making inferences, text analysis). Because of its comprehensive nature, this classification should be used to define what language is, and both of these proficiencies (BICS and CALP) should be addressed in the language classrooms.

As for how language is taught, over the years, language teachers have alternated between favoring teaching approaches that focus primarily on language use believing that one learns to communicate in a second language by communicating in that language (such as in an immersion experience) and those that emphasize language forms or analysis believing that one learns to communicate in a second language by learning the lexicogrammar (the words and grammatical structures) of that language.

However, there is evidence to support/refute both points of view because every individual follows his own unique way of development (Celce-Murcia and Larsen-Freeman, 1999). Therefore, it is essential to define language teaching in a way that suits both purposes, accounting for both the structure of the language and its communicative use. Accordingly, in such an approach, grammar is not merely a collection of forms but rather involves the three dimensions of what linguists refer to as the morphosyntactic form (morphology and syntax), the meaning (semantics), and the context-appropriate use (pragmatics) as displayed in the model of Celce-Murcia and Larsen-Freeman (1999, p. 4) below (see Figure 12).

Therefore, the emphasis is primarily on the concern that language teachers need to help their learners use the structures meaningfully and appropriately.

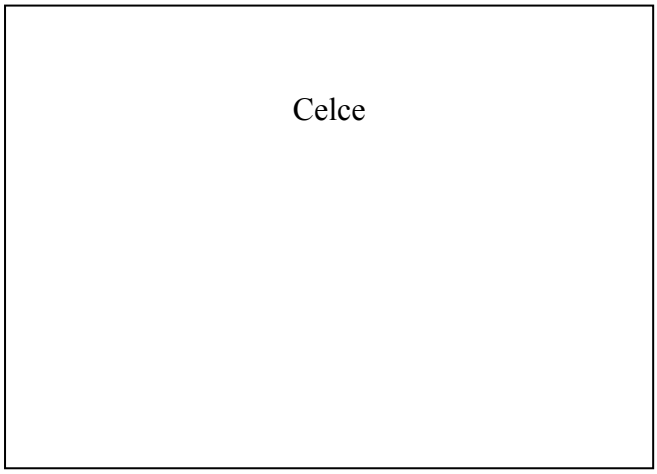

Figure 12. Definiton of grammar

Furthermore, in this approach, grammar operates at three different but integrated levels: the subsentential (morphological) level (involving the study of parts of speech: nouns, verbs, adverbs, adjectives, pronouns, determiners, prepositions, conjunctions), the sentential (syntactic) level (including the study of sentence types, sentence moods, subject/predicate relationships, markedness, voice), and the suprasentential (discourse) level.

Since the students participating in the present research study the first two levels in their English Grammar I and II courses, they should pay attention to the third (discourse) level in the English Composition II course. Thus, for the purposes of this study, discourse/suprasentential analysis and text selection carry crucial importance.

Accordingly, the analysis of language at the suprasentential (discourse) level includes the study of backgrounding and foregrounding, cohesion, register, genre,

and given/new concept. For instance, in narration, certain sentences provide background information while others function in the foreground to carry the main storyline, which is often achieved by the shifts in the verb tenses; and this kind of analysis can be done by studying backgrounding and foregrounding. Besides, the study of cohesion looks for the kind of organizational structure in the texts at the suprasentential level; and five linguistic mechanisms help to achieve such organizational structures, which include reference, ellipsis, substitution, conjunction and lexical cohesion (e.g., synonymy).

Furthermore, the study of register refers to the investigation of the level of formality of language; and register involves three variables: field –reflected in the choices of content words, tenor –concerned with the roles and relationships of the interlocutors, the degree of politeness and directness, and mode –referring to the channel of communication. In addition, the analysis of genre refers to the examination of the linguistic variation due to the communicative purpose to which language is put; and genre may range from a recipe or a letter of recommendation to a scientific research paper. Finally, the concept of given stands for the information that is assumed by the writer to be known by the reader, while the concept of new stands for the information that is "newsworthy" –not something the writer can take for granted that the reader knows (Celce-Murcia and Larsen-Freeman, 1999). Being aware of such elements of discourse, the learners can become sensitive about what language is and how language works.

As for the kinds of texts and the activities done on these texts, firstly, the contents of these texts should be interesting and broad enough to appeal to all the learners. In addition, the curriculum should be designed from a theme-based,

content-driven point of view so that interesting themes give learners a basis for understanding and acquiring new language structures and patterns, language develops along with cognition, social awareness, and language is used as well as talked about. Thus, in order to make the content interesting and broad enough to appeal to all the learners, the overall underlying theme of the course is determined as "we are the stories we hear and make." In this theme, the idea is that stories are fundamental to one's sense of identity and to dealing with experience, and that in any act of writing or speaking, our motivation is always telling a story in some form regardless of whether we are classifying, or comparing objects, or arguing issues. Therefore, keeping this unifying theme in mind, the learners need to be presented with products in various genres (ranging from myths, legends, fairy stories, fables, short stories, plays, their own personal anecdotes, news articles, magazine articles, to academic essays).

Consequently, these texts with their attractive contents and genres present many advantages. Firstly, such texts offer an effective way of introducing new language, making it meaningful and memorable because these authentic texts contextualize language diversity in register, genre, and narrative style. Therefore, providing good linguistic model to be imitated and to reflect on, these texts develop in the learners a heightened sense and awareness of language since they learn to associate the foreign language with experience of feelings as a first hand element in real events which matter to them and lead them to express what they want to communicate to other people as a cohesive and coherent whole, developing their fluency (Wright, 2000).

Second, as these texts are distinctive manifestations of cultural values and perceptions, personal analysis and reflections, and scientific factual findings, they give the learners time and chance to reflect on their own concerns, perceptions, and values in comparison with those of others, encouraging personal growth and inviting empathy and sharing between people (Wright, 2000),

Third, studying, responding to and producing such texts provokes in the learners being creative and imaginative, encouraging their curiosity, sharpening their observational and evaluation skills, leading them to seeing the possibilities of new relationships between bits of information (Wright, 2000).

On the whole, dealing with such texts in some form –either with a motivation to perceive or to produce- favors and stimulates the intellectual (critical, analytical, interpretational, creative, intuitive, productive), communicative, and affective (sensibility to other human realities such as poverty, racism, solidarity and improved self-dignity and self-awareness) response of learners. Finally, such a course of study incorporates broader engagement with language –including text analysis, process writing, and authentic content.

2.5 Summary of the Literature Review

This chapter contained the literature review that was composed of four sections. The aim of the first section which examined the basic brain anatomy with a specific emphasis on the neurons, neural activities, different parts of the brain and their various functions was to provide an initial exploration of what the brain's composing units are and how different parts of the brain operate to create the context for the comprehension of how the brain works.

The goal of the second section which presented a closer look at the general organization of the nervous system and its components and the endocrine system was to prove how the brain and body work in interaction and collaboration to keep the metabolism's natural balance at its proper state. In addition, this section underlined the fact that physiological states exert a great influence on the cognitive activities of a person.

The purpose of the third section which focused on relevant brain findings concerning various important educational themes including attention, consciousness, motivation, stress, emotions, the meaning-making process, memory formation and recall was to provide the essential connection between what happens at the physiological and psychological levels in learners and what happens in educational settings. Therefore, this section also presented direct implications and applications for the teaching/learning situations.

The aim of the last section was to present what language is and how language is learned in line with the definition and framework of a language teaching methodology.

On the whole, this chapter on the literature review on brain research accompanied by the principles and applications of the brain-based learning theory and on language teaching provided an extensive background which the researcher made use of to develop her own brain-based language teaching model for this study.

CHAPTER III

METHOD OF DATA COLLECTION

3.0 Presentation

In this chapter, first the design of the study is explained. Second, the research questions of the study are presented. Next, information about the subjects of the study is given. After that, brain-based English composition course is described. Finally, data collection instruments are explained.

3.1 The Design of the Study

This case study on students' attitudes towards brain-based applications was carried out in the English Composition II course (see the course outline in Appendix A) with a group of 23 first year students at the Department of Foreign Language Education at Middle East Technical University in the second half of the 2002-2003 academic year. The researcher was involved in the study as the course designer and course instructor.

This study is a case study because it focused on a class. Case studies become particularly useful when there is a need to understand some particular problem or situation in great depth, and where one can identify cases rich in information, rich in

the sense that great deal can be learned from a few samples of the phenomenon in question (Patton, 1987).

Accordingly, the main purpose of this study was to get a complete and in-depth understanding of the students' attitudes towards brain-based applications through their experiences in the English Composition II course.

As the first step of the study, the researcher/instructor conducted an extensive literature review on basic brain anatomy, neural activities, different parts of the brain and their functions, organization of the nervous system, endocrine system, relevant brain research findings and brain-based learning. The literature review made it possible for the researcher to identify the features of brain-based applications and design a brain-based language teaching model (see 3.4.1 section of this thesis for this brain-based language teaching model). Afterwards, the researcher designed and taught the ten-week English Composition II course according to the principles and applications of the brain-based language teaching methodology/model she had previously developed.

To ensure the validity and objectivity of the researcher's (who was the course instructor at the same time) instruction and implementation of the course, a colleague of the instructor observed the instructor's lessons for two weeks for a total of six hours by making use of the attitude questionnaire's items as the standards to be met, and reported her reflections about the course with reference to those standards (see Appendix F for the colleague observation report).

In the next step of the study, the researcher prepared the data collection instruments to be used after implementing the course for investigating students' attitudes towards brain-based applications in the English Composition II course.

First, a questionnaire was developed by the researcher to reveal students' attitudes towards brain-based applications by making use of the features of brain-based language teaching as described by her model. Then, the questionnaire was shown to three instructors of English Language Teaching and Curriculum Design in the Department of Foreign Language Education for its validity, and the necessary changes on the questionnaire as to the wording, format and length of the statements were made. Afterwards, the questionnaire was piloted on 10 students who did not participate in the ten-week brain-based English Composition II course but were still first year FLE students. Using the piloting data, the questionnaire items were revised; some items were reworded or changed for comprehensibility. After all the revisions were made, the questionnaire was presented to the sample group.

In the following step, to study students' attitudes towards the brain-based applications in greater depth, the researcher prepared questions to be asked in the interviews. Then, the interview questions were checked for their validity by two instructors of English Language Teaching and Curriculum Design in the Department of Foreign Language Education who had also examined the attitude questionnaire previously.

In this study, two kinds of instruments were used to collect data: a questionnaire and an interview. After receiving composition/writing training with a brain-based methodology for ten weeks, all of the 23 students were given a questionnaire which aimed at identifying their attitudes towards brain-based applications in the English Composition II course. One week later, the researcher conducted the interviews with 10 of the 23 students separately to investigate

students' attitudes towards brain-based applications in the course further in greater detail.

Then, the data gained from the questionnaire and the interviews were analyzed and interpreted to find out the answer for the research question which investigated students' attitudes towards brain-based applications in this course.

3.2 Research Question

This study addressed the following research question:

1. What are the students' attitudes towards brain-based applications in the English Composition II course?

In this respect, this study aimed to find answers to the following subquestions:

a. What are the students' attitudes towards the features of physical setting/environment in the course?
b. What are the students' attitudes towards the features of teacher-student roles and interaction in the course?
c. What are the students' attitudes towards the features of curriculum and instruction in the course?
d. What are the students' attitudes towards the features of assessment techniques and procedures in the course?

3.3 Subjects

The study was conducted with a group of 23 first-year students in their English Composition II course in the Department of Foreign Language Education at METU. Due to the regulations of the Foreign Language Education Department, students are assigned to the sections according to their surnames. Then, these sections are randomly assigned to the instructors. Therefore, the sampling method for this study was cluster random sampling. That is, the section was randomly selected by the administration and assigned to the instructors.

Besides, the students were familiar with the researcher/instructor since they took the English Composition I course from the same instructor in the previous term.

The age range of the subjects was 18-20. All of the students belonged to the same cultural and linguistic background. They were all Turkish and Anatolian Teacher Training High School graduates.

For the interviews, 10 of the subjects were selected by the researcher using the simple random sampling method. That is, the researcher randomly selected the names of the students and conducted interviews with them.

3.4 Brain-Based English Composition II Course

For this study, a ten-week brain-based English composition course was designed and taught. While designing the course, the researcher made use of the brain-based language teaching model she had previously developed in the light of the literature on brain research and brain-based learning. Thus, the next section presents this language teaching model of the researcher, and the section following

that explains the implementation of the brain-based English composition course as designed with reference to the model.

3.4.1 Brain-Based Language Teaching Model

The researcher designed the brain-based language teaching model in line with the findings of brain research, cognitive neurosciences, psychology, previous educational methodologies and previous language teaching methodologies. The model is composed of ten brain-based principles. Figure 13 below visually represents these principal components of the model. Moreover, each principle will be explained with references to the parameters of course design which are physical setting/environment, teacher-student roles and interaction, curriculum and instruction, and assessment techniques and procedures.

As demonstrated in Figure 13, the first component of the model is emotions. This principle emphasizes that since emotions are critical to learning, this methodology embraces emotions and helps the promotion of positive emotions. Therefore, in terms of the physical setting, a stress-free and responsive environment is created by meeting the needs considered in Maslow's hierarchy. As for the teacher-student roles and interaction, teacher helps students become aware of and manage their feelings and needs, and uses humor and stress management techniques to achieve a relaxed atmosphere. In addition, by making use of empowering language and behavior, interesting content and process-oriented assessment, teacher makes students feel more motivated and exhibit a positive self-concept.

Figure 13. Brain-Based Language Teaching Model

With respect to the features of curriculum and instruction, positive emotions are promoted by activities such as roleplays, celebrations, debates, journals, stories, plays and games. These also provide students with the opportunity to express their emotions and to reflect on their own concerns, values and perceptions in comparison with those of others, encouraging personal growth and inviting empathy.

The second component of the model is attention as reflected in Figure 13. This principle emphasizes that people attend to the internal and external occurrences only if they threaten their survival and/or promote pleasurable states and that the attention span for average adult is limited to 10 minutes. Accordingly, a continuous state of attentiveness is not possible, indeed not beneficial for the functioning of the human brain. Therefore, relevant and engaging activities providing the learners with choices and emotional involvement are employed; teacher makes use of novelty, creativity, contrast and humor to attract individual interests; and students are given process/break time not to force the limits of attention span and provided with reflection and metacognition opportunities to internalize the newly learned material. Furthermore, considering the attention span, process-oriented and multi-modal assessment techniques are used.

The third component of the model is multiple intelligences as depicted in Figure 13. This principle emphasizes that each brain is unique with its own strengths and weaknesses; and thus, in this methodology, teachers employ various strategies to attract individual interests and let students express and explore their multiple intelligences. As a result, activities might involve storytelling, socratic questioning, drawing, mindmapping, using gestures, drama, using music or voice rhythmically,

dynamically interacting with each other because learning is a social process, and introspection. In addition, the assessment techniques consider the multiple ways students process information and demonstrate their learning.

The fourth component of the model is whole-brain functioning (see Figure 13). This principle emphasizes the fact that since brain shifts its cognitive abilities on its high and low cycles (each lasting about 90-110 minutes) alternating between the verbal skills (in the left brain dominance) and the spatial skills (in the right brain dominance), a variety of activities which exploit the potential of both hemispheres are provided. These activities include term projects, journals, drama, drawing which require creativity, imagination and holistic thinking (right brain functioning) as well as essay analyses, peer reviews and internet research which encourage critical and analytical thinking (left brain functioning). In addition, the assessment techniques – presented in variety and over a period of time- also consider the brain's shifts between its high and low cycles. These include journals, term projects, self-evaluation, observation, portfolio and checklists.

The fifth component of the model is enrichment (see Figure 13). This principle emphasizes that to exploit the best of the learners' potential, the learning environment and experiences need to appeal to as many senses as possible, awakening the entire nervous system and providing multiple sources of information. The features include the provision of posters and bulletin boards outside the learners' immediate focus (peripheral learning), various resources, samples, maps and pictures of the target language country, and experts. In addition, drama, individual learning times and group interactions are employed to help orchestrate students' experiences and to promote the exploration and joy of learning.

The sixth component of the model is multiple memory pathways (see Figure 13). This principle emphasizes the fact that less frequently used memory types (procedural and episodic) need to be employed more and stronger connections need to be constructed among various memory types. Accordingly, when we incorporate real-world context with its many associations and hand-on exercises, students use the power of episodic and procedural memories as much as that of semantic and reflexive memories to improve recall. These activities include journals, roleplays, and term projects. In addition, in line with Howard's (2000) concept of state dependence, the learning environment provides as much spatial, temporal, sensory, semantic and emotional detail as possible to help create larger neural networks which allow multiple retrieval pathways.

The seventh component of the model is the construction of meaning (see Figure 13). This principle focuses on the fact that every individual creatively constructs his own meaning out of the material at hand by activating his prior knowledge, making personal and real-life connections, and actively interacting with the others. Consequently, the end-product for each person is something unique and personal. Accordingly, the contents through which the language is taught have substance enough to let students explore, discover, and expand themselves and their ways of thinking, allow creativity and personal contribution, and activate their background knowledge; the instruction involves variations and challenges such as metaphors, analogies, demonstrations, and patterning to direct learners to explore the deeply felt meaning and provides choices and practice. In this respect, student-generated questions are very valuable since they give clues about the kinds of patterns the students construct.

Besides, since the end-point of brain-compatible language teaching is getting the students transfer the acquired skills into their everyday lives (mastery and application), the assessment is process-oriented and multi-modal.

The eighth component of the model is music (see Figure 13). This principle emphasizes the fact that since music (Baroque and/or classical) fosters many cognitive functions such as spatial reasoning, creativity, reading skills and language and creates a relaxed and alert body state (because the heartbeat of a relaxed individual is 60 to 80 beats per minute and the beat of Baroque music is very close to this heartbeat), such music is used in the background during various classroom activities such as group work, projects, reflection, or prewriting activities, or as activity bridge.

The ninth component of the model is language (see Figure 13). This principle focuses on the idea that language teaching accounts for both the structure of language (talking about the language) and its communicative use (using the language). Accordingly, students become sensitive about what language is and how language works by doing textual analysis, as well as using the structures meaningfully and appropriately in writing. In addition, authentic texts with their interesting contents provide good linguistic model to be imitated and to reflect on by the students.

Lastly, the tenth component of the model is assessment (see Figure 13). This principle emphasizes that brain-compatible assessment is process-oriented and multi-modal, and provides detailed feedback. Therefore, brain-compatible assessment techniques and procedures show processes and improvement over time and provide extended product revisions (multiple drafts). They consider the multiple

ways students process information and can demonstrate their learning. Besides, they provide multiple sources of evaluation that gives an in-depth view of student progress. Furthermore, they support metacognitive processing and collaborative project work. Finally, they demonstrate the required level of mastery and provide students with detailed feedback on their performances. Thus, such techniques include rubrics, observation, self-evaluation, portfolio, term projects, weekly journals, and all in-class activities.

After this thorough presentation of the brain-based language teaching model with its guiding principles designed for the purposes of this study (please refer to Appendix O for a summary table which presents some sample activities and materials that have been designed based on the principles of this brain-based language teaching model), the following section explains the implementation of the brain-based English composition course as designed with reference to the model.

3.4.2 Implementation of Brain-Based English Composition II Course

The implementation of the brain-based English composition course lasted ten weeks (see Appendix A for the course outline). Each week, the lessons were prepared and conducted in line with the principles and applications proposed and justified by the researcher's brain-based language teaching model. (Three weeks' lesson plans are provided in Appendices B, C, and D to illustrate how the theory is realized and to make references to while explaining the implementation period.) Furthermore, to describe the implementation procedure, it was appropriate to analyze and evaluate the brain-based applications in English composition II course with respect to the features of physical setting/environment, teacher-student roles

and interaction, curriculum and instruction, and assessment techniques and procedures in line with the organization of the model.

Physical Setting/ Environment

First, to achieve an inviting and stimulating environment, the classroom included all the elements of pleasant smells and sounds, various resources, samples and working space all the time. The classroom selected for this course was 12m x 18m in area; thus, it was spacious enough to accommodate 23 students and allowed various seating styles. For instance, during some lessons (see Appendix B for Lesson Plan I), particularly while reading and discussing texts, students sat in a circle so that everyone could face each other.

Besides, half an hour before the lessons started, the researcher/instructor aired the classroom and kept the room's air fresh all the time. This is because oxygen is crucial for the brain to stay awake and alert. Fresh room sprays (scents of lemon, orange, rose, soft flowers) were also used because of the strong connection between olfactory (smell) glands and the autonomic nervous system; that is, what we smell triggers various responses, and such fresh smells increase attention through noradrenaline release and they lead to feelings of pleasure due to the endorphin receptors in the olfactory region. As for the pleasant sounds, the instructor made use of some Baroque selections such as Vivaldi, Handel, and Mozart, and classical music such as Rachmaninoff during some classroom activities for various reasons. To illustrate, in Lesson I (see Appendix K for the extended version of Lesson Plan I) when the students were asked to write their first essays –which was a group-essay writing activity, the instructor played Vivaldi in the background (setting the music's

volume at a level that is just perceptible when there is silence in the room) -while they were working in their groups to complete that challenging task- to keep them in an alert but relaxed state. In addition, having realized that the students preferred Baroque over classical, the instructor made more use of it and used particularly during group work, projects, reflection and prewriting/prereading activities.

As to the resources and samples, both the instructor and the students themselves had the responsibility to bring them to class. There were at least four different reference books about English grammar and writing (see Appendix A for the course outline for the reference books), three different monolingual English dictionaries (publications of Oxford, Cambridge, and Longman), and bilingual English-Turkish and Turkish-English dictionaries (Red House publications) brought by the instructor. As for the samples of the essays being studied, always, first samples were brought by the instructor. However, once they examined those samples, students themselves selected their own samples and brought them to class to be examined and discussed by the whole class. There was also a PC (personal computer), a projection device, and a TV-video set in the room.

Second, to help students unconsciously review the material being studied, the instructor made use of posters and bulletin boards. For instance, in Lesson I (see Appendix K for the extended version of Lesson Plan I), students displayed their outlines for the group-essay on posters and they were kept on the walls during that lesson. However, as can be seen in this example, since the classroom was being used by other classes as well during the week, they could not keep their posters on the walls as long as they needed to review their learning.

Third, to help students recall information more readily, the instructor provided as much sensory and semantic detail as possible. To illustrate, in Lesson III (see Appendix D for Lesson Plan III), as a preparation activity before the roleplay, the students were made to watch excerpts from the press conferences of Bush and Saddam so that they could identify with the roles (newsreporters) described in the roleplay by the help of all the sensory and semantic details provided by the video-clip.

In addition to such modifications and arrangements on the physical setting, the instructor told the students about Maslow's hierarchy of needs to help them become aware of and satisfy their physiological needs like oxygen, water, food, and a relatively constant body temperature. Actually, at the very beginning of the term, as a whole class, the students read and discussed the text on Maslow's hierarchy of needs (see Appendix E for this text) together with the instructor.

On the whole, the instructor could create a comforting and responsive physical setting for English composition course, which was further confirmed by the observations of a colleague of the instructor who observed the instructor's lessons for two weeks. The following excerpt from her reflection about the lessons she observed provides confirmatory evidence:

> The learning environment in the class I have observed is quite rewarding and stimulating in that there is a supportive and relaxed relationship both between the teacher and students, and among the students. Moreover, the resources, such as dictionaries, books and magazines related to the topic of the lesson, available for the students' use not only provide an inspiring and curiosity feeding setting but also enhance learning by helping students feel safe. Also remarkable to mention is the music played in the background

during group activities, which creates tranquility and adds to the peaceful environment.

(Full reflection is available in Appendix F: Colleague Observation)

Teacher-Student Roles and Interaction

Most important of all, to communicate to students that they are valuable and that they have the potential to master the skills to be studied, the researcher/instructor started the first lesson of the term with the "Rose Seed" handout (see Appendix G for the handout), in which rose seed metaphorically symbolizes the student who is not processed/schooled yet, but still has the potential to actualize himself/herself if the necessary conditions are provided. Thus, all through the term, the instructor employed empowering language and behavior towards the students.

In addition, the instructor encouraged the students to participate in various activities addressing different intelligences (such as roleplays, journal writing, reflection, sample essay analysis, drawing/mindmapping, term projects) so that they were provided with choices while learning and demonstrating their learning. Particularly, by the term projects and journals (see Appendix A for the course outline), which were of less-restricting nature and provided the arena for the students to express their thoughts and feelings in a more critical manner with real-life references, students were intrinsically motivated to set their own goals and make personal connections with the material at hand. This was also made possible by the instructor's being accepting, non-judgmental and non-threatening while interacting

with the students and by the mutual love, caring and respect between the instructor and the students.

Furthermore, as well as modeling it, the instructor told the students about the emotional intelligence, emotional self-management, to help them become aware of and manage their feelings. For this purpose, in one of the first lessons of the term, as a whole class, the students read and discussed the text on the emotional intelligence (see Appendix H for this text) together with the instructor. In the further lessons, it was observed that some students started to refer to the emotional intelligence and its applications in their weekly journals and in whole-class discussions. Besides, students exercised stress management techniques such as relationship skills, peer support and physical movement in the classroom. For instance, students were made to receive peer help by working in groups when they were to complete relatively challenging tasks as in Lesson I when they were to write an essay for the first time, or as in Lesson III in the roleplay when they were to solve quite a complex problem (see Appendix B for Lesson Plan I and Appendix D for Lesson Plan III). Another example was that some students who felt quite nervous during the in-class writing sessions were advised to walk for some time out in the open-air and start to write when they felt relaxed (see Appendix A for the course outline for the in-class writing sessions).

On the whole, the instructor, with her sincere and non-threatening attitude towards the students, could achieve a positive and constructive relationship with the students, encouraging and guiding their growth through creative and cooperative learning situations, which was further confirmed by the observations of a colleague of the instructor who observed the instructor's lessons for two weeks. The following

excerpt from her reflection about the lessons she observed provides confirmatory evidence:

> The teacher helps students develop positive attitudes towards learning and the subject matter itself. She encourages them to become independent learners who can take the responsibility of their own learning and can reflect on their process. There is a strong presence of the teacher in terms of providing information and guidance when necessary. There is a lot of encouraging language to praise and motivate learners. Another point attracted my attention during the class is the fact that the teacher maintains consistency by setting the rules and expectations beforehand so that students are aware of their roles and responsibilities. For example, while they are preparing for the role-play activity, the teacher just reminds them to consider the checklist they have had before by eliciting the points mentioned there. Students seem to be having fun working together in collaboration.
>
> (Full reflection is available in Appendix F: Colleague Observation)

Curriculum and Instruction

As proposed by the model, the course was designed and implemented from a content-driven, thematic point of view, and the underlying/unifying theme of the course was "We are the stories we hear and tell." Because everyone has a story to tell and these stories may appear in various genres, the theme could be interesting, broad and substantial enough to appeal to all of the students. They could both make use of their existing knowledge, and explore and expand themselves and their ways of thinking. For instance, in Lesson I in which they read a research paper on a young girl's experience of the adolescence period, as well as learning about her "story",

they could go internal and review what they themselves had previously experienced in their own years of adolescence (see Appendix L for this research paper). Besides, it was observed that some students even stated that it was the first time they could perceive those years as a natural biological and psychological stage in the development of human being, and some even realized that they were still in the process of adolescence in certain aspects. Thus, contents encouraged personal growth, empathy and sharing among the students.

In addition to being relevant to students' lives and experiences in terms of content, these texts from various genres also provided good samples which contextualized language, provided good model for examination, analysis and imitation on the part of the students. First of all, by making the students read a research paper (which is a text type those students will read and write in the further years of their training) in one of the first lessons of the term (see Appendix L for this research paper), the researcher/instructor could communicate to the students that what they would do in the class had substance and was meaningful for their future life. While analyzing the language of the paper, the instructor directed the students' attention to the discourse elements such as backgrounding/foregrounding, cohesion, register, genre, given/new concepts. By such applications, students became more sensitive about what language is and how language works. They found such analysis very enjoyable like a game. As for the imitation of the language of the samples, the students seemed to have a tendency to try using the structures they learned in their weekly journals in which they were not penalized for their grammar mistakes.

As for the activities, they were also of various types to consider the individual strengths and weaknesses of every student in the class because the

researcher/instructor believes that our strengths are our ways of learning that have been enhanced through our life experiences and our weaknesses are the ways of learning that have been hindered or never activated at all during our lifetime and every student is equally capable of mastering anything if he is treated through his own strengths. As a result, activities involved storytelling, narration (e.g., reading texts, journals), socratic questioning (e.g., textual analysis, discussions on sample essays, essay checklist construction), drawing/mindmapping (e.g., the drawing of personality features in Lesson Plan II in Appendix C), using drama (e.g., the roleplay in Lesson Plan III in Appendix D), using the voice rhythmically (e.g., students' paying attention to intonation and rhythm while talking in roleplays), dynamically interacting with others (e.g., while drawing and writing the features of the person A and person Z on the board in Lesson Plan II in Appendix C), and bringing feeling into the presentation (e.g., in roleplays, and while participating in discussions).

Furthermore, to achieve whole-brain functioning and thus to activate the right brain through experiential/hands-on tasks and to activate the left brain through explanatory/analytical tasks, the instructor employed term projects, journals, drama, drawing/ mindmapping which required creativity, imagination and holistic thinking and helped the construction of episodic and procedural memories, as well as essay analyses, peer reviews, internet research, and checklist construction which encouraged critical and analytical thinking and helped to construct semantic/declarative memories. For instance, in Lesson III, when they were watching the video-clip before the roleplay, all of their intelligences were activated and there was whole-brain functioning. Later, they critically read and analyzed the

problem situation with reference to their existing knowledge concerning the Iraq-USA war, which required left brain functioning to a great extent. Then, in the actual performance stage, they were to empathize with the role in the card (newsreporter), consider all the information appearing in the spontaneous conversation, develop strategies to handle the situations, listen to and respond to the other party, all of which required creativity, imagination and holistic thinking as well as the critical and analytical procedures and this led to the functioning of the whole-brain. Whole-brain functioning is crucial in educational settings because the brain shifts its cognitive abilities on its high and low cycles (each lasting about 90-110 minutes) alternating between the left brain and the right brain functions. In line with this fact, for instance, assessment was also process-oriented allowing multiple-drafts in writing (see Appendix A for the course outline).

In addition, since an average adult's attention span is around 10 minutes, the instructor provided process/down time every 10-15 minutes and -to avoid habituation- employed variety in quality and quantity of the information being explored. For instance, in Lesson III, after watching the video-clip (before the roleplay) for around 10 minutes, they were made to go internal and process that information in relation to what they had previously read, watched and written about the topic of Iraq-USA war. Again, to activate the reticular formation and provide the release of noradrenaline to achieve an alert state, the instructor either played Baroque music in the background during group work (novelty), or introduced some kind of contrast, like providing contradicting information in her presentation in order that students pay attention to be able to recognize the inaccurate pattern/information.

Moreover, to help the students become more aware of and manage their needs and emotions, from the very beginning of the term, the instructor spent the first hour of the lessons each week on reading and discussing some texts on these topics (see Appendix E and H for these texts). Besides, every week around 15 minutes was spared for talking about their new experiences on campus and in their courses in general. The instructor listened to their common problems and tried to direct them towards solutions. For instance, they had difficulties in time and stress management, which corrupted their physiological and psychological states as well. They were advised about how to plan their time more efficiently, how to set priorities, how to organize their work, how to manage their emotions and relax their stressed body through breathing, diary-journal keeping, physical movement, or detachment.

On the whole, the course, with its contents/themes and activities, appealed to the multiple intelligences of the students, providing choices, embraced their emotions and needs, allowed personal connections and relevance on the part of the learners, expanded their horizons and ways of thinking, promoted their reflection and metacognitive skills, all of which were further confirmed by the observations of a colleague of the instructor who observed the instructor's lessons for two weeks. The following excerpt from her reflection about the lessons she observed provides confirmatory evidence:

> The content of the lesson is chosen carefully from daily topics (e.g. Iraq war), which arouses interest and lets students explore, discover, and expand themselves as well as questioning their ways of thinking. The teacher encourages students to include their feelings, ideas, and emotions into what they are doing by providing a variety of activities integrated into one lesson

(e.g. working in groups to get prepared for the role-play, doing an intensive reading about the situation and their roles, coming onto the stage and acting as well as listening, reflecting on their friends' performance, and conducting a whole-class discussion, and a feedback session on what they have just practiced). Also, the activities and tasks are challenging in terms of content and language so that students can have the sense of satisfaction and success. However, students are not forced to produce anything unless they are ready and the teacher provides the necessary help and praise for them to feel confident.

(Full reflection is available in Appendix F: Colleague Observation)

Assessment Techniques and Procedures

Initially, the instructor emphasized that no student would be left without reaching the required level of mastery. To communicate such philosophy, the instructor guided and monitored the students' learning very closely, providing detailed, specific, personal, and immediate feedback at each stage of their growth until all of them –one by one- achieved the expected level of performance. For this purpose, the instructor included rewrite opportunities and review sessions, portfolio, and used rubrics/checklists. In fact, the checklists for the essays were constructed during the lessons with the students (e.g., the construction of argumentative essay checklist in Lesson III in Appendix D). In addition to this, when the students were to write a journal for the first time, they were provided with a sample journal so that they could see the expected performance beforehand. Again, they were provided with a roleplay checklist when they were to practice it for the first time (e.g., the same rubric was used in Lesson III in Appendix D). The instructor ensured that the

students were sure about what they were expected to do. As a result, they felt challenged but not threatened.

As well as their written products such as term projects, in-class writings, journals, and peer reviews, their performance in roleplays, mindmaps/drawing, self-evaluation and reflection were also considered as part of the overall assessment (see Appendix A for the course outline for the evaluation criteria). This meant that the assessment was process-oriented (including rubrics, checklists, observation, portfolio, and self-evaluation) to help students see their processes and improvement over time, far from being there to punish the students. Besides, such evaluation considered the brain's shifts between its high and low cycles.

With the detailed feedback provided by the instructor, the students could reflect on and improve the quality of their work. For instance, while preparing their term projects (see Appendix A for the course outline for the term project), at every stage from the topic selection to the initial research and to the outline construction and the actual writing, they received continuous and specific feedback from the instructor. Again, their regular in-class writing sessions during which they were allowed to interact with each other and could refer to any reference materials or dictionaries they needed, were among the happiest occasions for them because they could taste the pleasure of learning from each other though those in-class writing sessions were considered as exam situations.

On the whole, the instructor's assessment techniques and procedures helped the students experience pleasurable states while at the same time mastering the essential writing skills, which was further confirmed by the observations of a colleague of the instructor who observed the instructor's lessons for two weeks. The

following excerpt from her reflection about the lessons she observed provides confirmatory evidence:

> There exists a checklist available for each student in order to assess their own progress. They become aware of their strengths and weaknesses also by reflecting on their friends' work. Obviously, there are multiple sources of evaluation such as portfolio, process writings, classroom activities, and self-evaluation, which focuses on the students' improvement over time rather than assessing their knowledge merely by means of exams and quizzes (They allocate a block after the class time in order to give feedback to each other). I have seen some of the students' essays with detailed feedback focusing not only on the form but also on the content, personal opinions, and creativity, which shows that their work is given importance and considered carefully.
>
> (Full reflection is available in Appendix F: Colleague Observation)

3.5 Data Collection Instruments

For the purpose of this study which aimed to investigate students' attitudes towards brain-based applications in English Composition II course, both quantitative and qualitative data were collected. The quantitative data were collected through an attitude questionnaire. The qualitative data were collected through interviews. In data collection, the process of involving more than one data source and more than one method enhances validity in research (Merriam, 1992).

3.5.1 Quantitative Data

3.5.1.1 Attitude Questionnaire

An attitude questionnaire was used to collect quantitative data to answer the research question on students' attitudes towards brain-based applications with respect to the features of physical setting/environment, teacher-student roles and interaction, curriculum and instruction, and assessment techniques and procedures (see Appendix G for the attitude questionnaire).

An attitude questionnaire –used in another study and analysed in terms of reliability and validity issues- could not be found in the literature to adapt for this study since a totally new model was implemented in this study. Hence, the researcher prepared a new attitude questionnaire based on the questionnaire construction techniques described by Griffee (1999), and Gardner and Masgoret (2003).

As the construct of the questionnaire was students' attitudes, the questionnaire aimed to find data on the attitudes of students towards brain-based applications that were implemented in the English Composition II course. The 52-item questionnaire was composed of four sections. The first section which included the items from 1 to 5 aimed to find information on students' attitudes towards the features of physical setting/environment in the course; the second section which included the items from 6 to 16 aimed to gather data on students' attitudes towards the features of teacher-student roles and interaction in the course; the third section which included the items from 17 to 44 asked about students' attitudes towards the

features of curriculum and instruction in the course; and the fourth section which included the items from 45 to 52 aimed to identify students' attitudes towards the features of assessment techniques and procedures in the course.

The questionnaire items were in the form of statements with close-ended responses. Thus, a 6-point Likert scale, a questionnaire with a range of possible answers, was used based on the possible answers strongly agree, agree, undecided, disagree, strongly disagree, and not applicable. The "not applicable" option meaning that "the application mentioned in the item was not present during the course" was also included so that the students would be able to state that rather than being obliged to rate their degree of like/dislike.

While writing the questionnaire, the researcher tried to avoid statements that are complex, leading, or ambiguous. Although there was special terminology such as rubrics/checklists, journals, reflection, emotional intelligence, multiple intelligences, stress management, reflection, metacognition, roleplay, or metaphor employed in the items, they were left as they were because during the course students became familiar with such terms and concepts. It should be noted that this questionnaire was particularly designed to investigate students' attitudes towards brain-based applications in the English Composition II course in the Department of Foreign Language Education at METU.

The questionnaire was shown to three instructors of English Language Teaching and Curriculum Design in the Department of Foreign Language Education for its validity. They gave suggestions on the wording, format and length of the statements in the questionnaire. Some items were criticized for being double barreled (posing two questions in one); however, at that point, it was clarified that

each time the conjunction “and” appeared, it meant that the item was complete if and only if both conditions were present. To illustrate, item 14, “I felt both comfortable and motivated because the teacher was accepting, nonjudgmental, and non-threatening while interacting with us,” meant that the student felt comfortable and motivated at the same time as a result of teacher’s being accepting, nonjudgmental and non-threatening all at the same time.

After the necessary changes were made on the construction of the statements related to their clarity, the questionnaire was piloted on 10 students who did not participate in the ten-week brain-based English Composition II course but were still first year FLE students. The subjects in the piloting group were asked to mark the unclear and ambiguous statements. They mostly had problems in understanding the special terminology mentioned previously in this section. Using the piloting data, the questionnaire items were revised; some items were reworded or changed for comprehensibility. After all the revisions were made, the questionnaire was presented to the sample group.

3.5.2 Qualitative Data

3.5.2.1 Interviews

For this study, to obtain more detailed information about students’ feelings and opinions about the brain-based applications in the English Composition II course, 10 of the 23 students were interviewed. Different from the attitude questionnaire and in addition to investigating how students felt about the brain-based applications, the interview questions also aimed at revealing why students felt

the way they felt and exploring their opinions, likes and dislikes, suggestions and preferences about the brain-based practices in the English Composition II course (see Appendix H for the interview questions).

The questions asked during the interviews were prepared by the researcher beforehand. That is, semi-structured interviews were conducted for this study. Before the interviews, the questions were checked by two instructors of English Language Teaching and Curriculum Design in the Department of Foreign Language Education who had also examined the attitude questionnaire previously.

All of the interviews were conducted in the researcher's office on the predetermined times arranged by the subjects and the researcher at the end of the study and one week after the administration of the attitude questionnaire. Each interview lasted 15-20 minutes. The students were interviewed in English, but they could switch to Turkish if they found it difficult to express themselves in English. Furthermore, subjects were informed that the interviews would be tape-recorded. Later, the interviews were transcribed by the researcher.

3.6 Data Analysis and Interpretation Procedures

In this study, both quantitative and qualitative data were collected.

Firstly, the analysis of the quantitative data obtained from the attitude questionnaire was done. The responses for the questionnaire were analysed in two different ways. First, analysis of the questionnaire was done through calculating the mean score for each item in the questionnaire separately. Second, the frequency and the percentages of students' responses were identified. Then, the results were presented in tables. Finally, all the findings were interpreted and discussed.

Secondly, the analysis of the qualitative data collected through interviews was done. Responses to the interview questions were analysed via cross-case analysis, identifying students' general tendencies by the common answers given by the students. Then to analyse the interviews, first the interviews were transcribed. Later, each response for the questions was analysed and grouped under related headings. Next, the results were presented in frequency tables. Finally, all the findings were interpreted and discussed.

CHAPTER IV

DATA ANALYSIS & INTERPRETATION of RESULTS

4.0 Presentation

In this chapter, both the quantitative and the qualitative data are analyzed. Firstly, the analysis of the quantitative data obtained from the attitude questionnaire are presented. Secondly, the analysis of the qualitative data collected through interviews are analyzed. Finally, the results are interpreted and discussed.

4.1 Analysis of Quantitative Data

In this study, an attitude questionnaire was used. The questionnaire was administered at the end of the brain-based English composition course and aimed at identifying the students' attitudes towards the brain-based applications in the course.

4.1.1 Analysis of the Responses to Attitude Questionnaire

The attitude questionnaire is composed of four sections. Each section focuses on a different component of the brain-based model and students' attitudes towards the features of that component. The components include the physical setting/environment, teacher-student roles and interaction, curriculum and instruction, and assessment techniques and procedures.

The subjects answered the items in the questionnaire on a Likert scale of 1 to 5, where 5 stood for "Strongly Agree", 4 stood for "Agree", 3 stood for "Undecided", 2 stood for "Disagree", and 1 stood for "Strongly Disagree". In addition, the "Not Applicable" option was not considered in the analysis of the responses because none of the students selected that option for any item stated in the questionnaire.

Since the questionnaire is composed of four sections, the students' responses for each section were analysed and presented independently. The responses were analysed in two different ways. First, analysis of the questionnaire was done through calculating the mean score for each item in the questionnaire separately. Second, the frequency and the percentages of students' responses were identified. Mean score and percentage analyses for the questionnaire, which is based on a 5-point Likert scale, were conducted using the SPSS program. Then, the results were presented in tables. While interpreting the responses, scores 4 and 5 are considered as positive, 3 as neutral, and 1 and 2 as negative attitudes. However, because scores generally vary between 4 and 5, for the ease of interpretation, positive scores are further graded as "low" for the scores between 4.0 and 4.3, as "moderate" for the scores between 4.3 and 4.5, and as "high" for the scores between 4.5 and 5.

A. Section 1: Attitudes towards the Features of Physical Setting/Environment

The first section of the questionnaire focuses on students' attitudes towards the features of physical setting/environment in the brain-based English composition course. In Table 1 below, students' mean scores obtained for each item in this section are presented. As it is noticed the average mean is found to be 4.45 out of 5.

Thus in general, students had highly positive attitudes towards the features of physical setting/environment.

Table 1. Means of Responses to Attitudes about the Features of Physical Setting

Items		**Means**
1	Learning was fun because the environment was responsive (that is, there were open, respectful and cooperative relationships).	4.78
2	I liked seeing materials such as posters and bulletin boards in the classroom which reflected the topic and the language being studied.	4.30
3	I felt both comfortable and receptive because the environment was an inviting and stimulating setting which included all the elements of pleasant smells and sounds, various resources, samples and working space.	4.39
4	I could recall information more readily because the environment provided as much visual, auditory, sensory, and semantic detail as possible.	4.61
5	I felt both relaxed and alert because of the Baroque (e.g., Vivaldi)/classical (e.g., Rachmaninoff) music that was played in the background during some classroom activities (such as group activities, projects, reflection or prewriting activities).	4.17
	Average	**4.45**

In the first section of the questionnaire, the highest mean score for an item, 4.78, was obtained for item 1, which indicates that students thought learning was fun because the environment was responsive. Similarly, the mean score of item 4 (4.61) is a high mean score, which depicts that students believed they could recall information more readily by the help of all sensory and semantic detail provided by the environment. Besides, moderately high mean scores were found for items 2 (4.30) and 3 (4.39), which shows that students liked to see posters and bulletin boards in the classroom reflecting the topic and language being studied (item 2), and that they felt comfortable and receptive due to the environment's being an inviting and stimulating setting through the elements of pleasant smells and sounds, various

resources, samples, and working space (item 3). On the other hand, the lowest mean score in this section, 4.17, was found for item 5, though it is still a high mean score since it is above 4, which indicates that students felt relatively relaxed and alert because of Baroque/classical music played in the background during various activities.

In Table 2 below, the frequency and the percentages of students' responses are given. Since responses 4 and 5 are considered to be positive and 1 and 2 as negative, their percentages are summed while interpreting the results.

Table 2. Students' Responses to Attitudes about the Features of Physical Setting

	Physical Setting/Environment									
Items	**5**		**4**		**3**		**2**		**1**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
1	18	78	5	22	---	---	---	---	---	---
2	9	39	12	52	2	9	---	---	---	---
3	11	48	10	43	2	9	---	---	---	---
4	15	65	7	31	1	4	---	---	---	---
5	10	44	8	35	4	17	1	4	---	---

When the results in Table 2 are analysed, it is observed that all of the 23 students felt that learning was fun because the environment was responsive (item 1). Similar to that, 91 % of the students liked to see posters and bulletin boards in the classroom reflecting the language and topic being studied (item 2) and none of them had a negative attitude about this feature. Again, 91 % of the students felt comfortable and relaxed due to the environment's being an inviting and stimulating setting through the elements of pleasant smells and sounds, various resources, samples and working space (item 3) and no student had a negative attitude about this

feature. In addition to these, almost all of the students, that is 96 % of the students, stated that they could recall information more readily by the help of all sensory and semantic detail provided by the environment (item 4) and none of them stated a negative attitude about this feature. Again, only one student, that is 4 % of the students, stated he did not feel relaxed and alert due to Baroque/classical music played in the background during various activities, while 79 % of the students stated a positive attitude about this feature.

On the whole, students' responses for the items in this section on students' attitudes towards the features of physical setting/ environment indicate highly positive attitudes on the part of the students. The majority of the students found learning in responsive, inviting and stimulating settings fun and they felt relaxed and receptive as a result of the features of such settings.

B. Section 2: Attitudes towards the Features of Teacher-Student Roles and Interaction

The second section of the questionnaire focuses on students' attitudes towards the features of teacher-student roles and interaction in the brain-based English composition course. In Table 3 below, students' mean scores obtained for each item in this section are presented. The average mean 4.70, out of 5, can be interpreted as again students' having highly positive attitudes towards the features of teacher-student roles and interaction.

Table 3. Means of Responses to Attitudes about the Features of Teacher-Student Roles and Interaction

Items		Means
6	I liked the teacher's helping me to become aware of and manage my feelings.	4.87
7	I felt relaxed because the teacher employed various strategies to attract our individual interests (such as by roleplays, weekly journals, sample essays, or projects).	4.78
8	I liked consciously reviewing my learning through activities such as journal writing, reflection, and self-evaluation to develop personal connections with the material at hand.	4.78
9	I liked actively participating in the educational process through interactive, creative, cooperative and collaborative learning situations (such as roleplays and term projects).	4.17
10	I felt relaxed because the teacher guided my learning, growth and development through her constructive feedback and her close observation of my progress.	4.91
11	I felt both responsible and motivated because the teacher employed empowering language and behaviour towards me (e.g., You can do it).	4.65
12	Learning was fun because there was mutual love, caring and respect between the teacher and us.	4.87
13	I enjoyed the lessons because the teacher provided well-planned lessons.	4.78
14	I felt both comfortable and motivated because the teacher was accepting, nonjudgmental, and non-threatening while interacting with us.	4.87
15	I felt motivated because the teacher encouraged me to set specific and realistic goals and to see the connections between my actions and their outcomes.	4.43
16	I felt relaxed because we exercised stress management techniques such as relationship skills, peer support, and physical movement in the classroom.	4.65
	Average	**4.70**

In the second section of the questionnaire, the highest mean score for an item, 4.91, was obtained for item 10, which indicates that students felt highly relaxed due to the teacher's guiding their learning, growth and development through her constructive feedback and her close observation of their progress. In relation to this item, for item 15, 4.43 was obtained as the mean score, which shows that

students felt motivated because of teacher's encouraging them to set specific and realistic goals and to see the connections between their actions and their outcomes. Moreover, high mean scores were found for items 7 (4.78) and 13 (4.78), which indicates that students felt highly relaxed due to the teacher's employing various strategies to attract their individual interests (item 7) and they enjoyed the lessons as they were well-planned (item 13).

Likewise, the mean scores were found to be high for items 6, 12, 14, that is 4.87 for each, which indicates that students liked teacher's helping them to become aware of and manage their feelings (item 6), that students found learning fun because there was mutual love, caring and respect between the teacher and themselves (item 12), and that students felt both comfortable and motivated because of the teacher's accepting, non-judgmental, and non-threatening attitude while interacting with them (item 14).

In addition, the mean scores for items 11 and 16, both of which address students' management of their emotional states during the course, were found to be the same, that is 4.65 for each. This score, which is a highly positive score, indicates that students felt both responsible and motivated because the teacher employed empowering language and behavior towards them (item 11) and that students felt relaxed because they exercised stress management techniques in the classroom (item 16). As for item 8, which inquires whether they liked intrapersonal/ individual activities such as journal writing and reflection, the mean score was 4.78, while the mean score was 4.17 for item 9, which investigates whether they liked interpersonal/group-pair activities such as roleplays. Although 0.61 difference between these two mean scores indicates a preference for intrapersonal activities

over interpersonal ones, the fact that these two mean scores are above 4 indicates that students both liked to consciously review their learning through activities such as journal writing and reflection (item 8) and to participate in the educational process through interactive, creative and cooperative activities such as roleplays (item 9). The mean score for item 9, that is 4.17, was also the lowest score obtained in this section of the questionnaire.

In Table 4 below, the frequency and the percentages of the students' responses are displayed and then they are explained.

The results presented in Table 4 indicate that none of the students had a negative attitude about any feature of teacher-student roles and interaction in the brain-based English composition course. All of the students stated that they liked teacher's helping them to become aware of and manage their feelings (item 6), that they felt relaxed due to teacher's employing various strategies to attract their individual interests (item 7), and that all of them liked to consciously review their learning through intrapersonal activities such as journal writing and reflection (item 8). Similarly, the results reveal that a hundred per cent of the students felt relaxed due to teacher's guiding their learning, growth, and development through her constructive feedback and her close observation of their progress (item 10), that they felt both responsible and motivated because the teacher employed empowering language and behavior towards them (item 11), that they found learning fun because there was mutual love, caring and respect between the teacher and themselves (item 12), and that they felt both comfortable and motivated because the teacher was accepting, non-judgmental, and non-threatening while interacting with them (item 14).

Table 4. Students' Responses to Attitudes about the Features of Teacher-Student Roles and Interaction

	Teacher-Student Roles and Interaction									
	5		**4**		**3**		**2**		**1**	
Items	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
6	20	87	3	13	---	---	---	---	---	---
7	18	78	5	22	---	---	---	---	---	---
8	18	78	5	22	---	---	---	---	---	---
9	8	35	11	48	4	17	---	---	---	---
10	21	91	2	9	---	---	---	---	---	---
11	15	65	8	35	---	---	---	---	---	---
12	20	87	3	13	---	---	---	---	---	---
13	19	83	3	13	1	4	---	---	---	---
14	20	87	3	13	---	---	---	---	---	---
15	12	52	9	39	2	9	---	---	---	---
16	16	70	6	26	1	4	---	---	---	---

In addition to these, 83 % of the students liked to participate in the educational process through interactive, creative and cooperative learning situations (item 9); 96 % of the students stated that they enjoyed the lessons because they were well-planned (item 13); 91 % of the students stated that they felt motivated because the teacher encouraged them to set specific and realistic goals and to see the connections between their actions and their outcomes (item 15); and 96 % of the students stated that they felt relaxed because they exercised stress management techniques in the classroom (item 16).

On the whole, the second section of the questionnaire depicts that all the students participated in this study had highly positive attitudes towards the features of teacher-student roles and interaction. Particularly, they liked it very much when the teacher employed various strategies to attract their individual interests, helped them to set goals for their learning, used empowering language and behaviour

towards them, and guided their learning through her constructive feedback and close observation of their progress.

Moreover, they valued a positive and constructive relationship between the teacher and themselves so much that they liked it when the teacher helped them to become aware of and manage their feelings, acted in an accepting, non-judgmental and non-threatening manner while interacting with them and when there existed mutual love, caring and respect between the teacher and themselves. Finally, they liked both intrapersonal and interpersonal activities, but a slightly high preference for intrapersonal activities over interpersonal ones was also observed in the results.

C. Section 3: Attitudes towards the Features of Curriculum and Instruction

The third section of the questionnaire focuses on students' attitudes towards the features of curriculum and instruction in the brain-based English composition course. Since there are 28 items for this section in the questionnaire, the table presenting students' mean score for the items in this section is divided into three: Table 5a presents students' mean scores for items from 17 to 26, Table 5b presents students' mean scores for items from 27 to 36, and Table 5c presents students' mean scores for items from 37 to 44.

In Table 5a, Table 5b and Table 5c below, students' mean scores obtained for the items in this section are presented. As Table 5c indicates, the average mean is 4.48, out of 5, which can be interpreted as students' having positive attitudes towards the features of curriculum and instruction.

Table 5a. Means of Responses to Attitudes about the Features of Curriculum and Instruction (items=17-26)

Items		Means
17	I liked the contents through which I learned the language because they had substance enough to let me explore, discover, and expand myself and my ways of thinking (e.g., term projects, or journal writing).	4.65
18	I enjoyed learning about emotions and the emotional intelligence.	4.43
19	I liked learning about Maslow' s hierarchy of needs to become more aware of our needs.	4.30
20	Learning was fun because the teacher provided opportunities for our expression and engagement of emotions through various classroom activities (such as drama, music, journal writing, collaboration, team/pair work, and novelty and curiosity seeking activities).	4.57
21	I felt confident to participate in all the activities including drama, games, discussions, debates, reflection about personal issues, and celebrations.	4
22	I felt both relaxed and fully in control because I was able to set my own goals and make use of my background knowledge.	4.48
23	I enjoyed learning because I was encouraged to construct my own meaning rather than being presented with a linear, planned, piece-by-piece presentation of language and content.	4.57
24	I liked to organize and practice the newly learned material on my own.	4.43
25	I enjoyed learning because the teaching included variations and challenges (after I demonstrated initial comprehension of the new material) in order to make me explore the material's deeply felt meaning.	4.61
26	I liked the teacher's providing me with opportunities for tasks such as assignments, projects, writing scripts, and personal progress reports to review old materials.	4.57

Table 5b. Means of Responses to Attitudes about the Features of Curriculum and Instruction (items=27-36)

Items		Means
27	I felt alert in the lessons because they were scheduled between 9:00 a.m. and 13:00 p.m.	4.04
28	I felt both alert and receptive because the instruction involved some kind of suddenness (surprise effect), loudness, contrast, novelty, or movement-related and creativity-seeking activities.	4.39
29	I felt focused because the instruction provided a variety of activities which required intuition, insight, creativity, or imagination.	4.61
30	I felt both relaxed and fully in control because I was able to make use of my background knowledge.	4.30
31	I felt motivated because the lessons required the use of metaphors, stories, role-playing, movements, discussions, demonstrations, or drawing.	4.30
32	I felt motivated because I participated in meaningful and challenging lessons that invoked my curiosity and search for meaning.	4.09
33	I enjoyed learning because the instruction involved various strategies to reach all seven intelligences (such as teaching through narration, questioning, drawing concepts, using drama, using voice rhythmically, dynamically interacting with the others, and bringing feeling into presentation).	4.65
34	Learning was fun because the lessons reflected a natural connection to real-life experiences (e.g., term projects, or roleplays).	4.83
35	I felt positively challenged because activities that required the use of computer, internet, authentic magazines, or newspapers took place in the classroom.	4.22
36	I felt both motivated and receptive because the instruction was at or just above my proficiency level.	4.65

The highest mean score for this section is 4.91 given to item 38 (in Table 5c), which indicates that students felt motivated because the learning was a process of creative construction and it involved trial and error. The second highest mean score (4.83) is found for item 34 (in Table 5b), which shows that students found learning fun because the lessons reflected a natural connection to real-life

experiences, and for item 37 (in Table 5c), which shows that students felt relaxed because they were not forced to produce anything until they felt ready. The third highest mean score (4.78) is found for item 43 (in Table 5c), which depicts that students liked the course materials' giving them time and chance to reflect on their own concerns, perceptions and values in comparison with those of others, encouraging personal growth, inviting empathy and sharing between them, and for item 44 (in Table 5c), which indicates that students thought learning was fun because studying, responding to, and producing the course materials all led them to both sharpen their observational and evaluation skills and to see the possibilities of new relationships between bits of information.

Similarly, 4.65 was the mean score obtained for items 17 (in Table 5a), 33 (in Table 5b) and 36 (in Table 5b), which indicates that students liked the contents through which they learned language because they had substance enough to let them explore, discover and expand themselves and their ways of thinking (item 17), that students enjoyed learning because the instruction involved various strategies to reach all seven intelligences (item 33), and that students felt both motivated and receptive because the instruction was at or just above their proficiency level (item 36).

Besides, for items 25 (in Table 5a) and 29 (in Table 5b), the mean scores were found to be 4.61, which shows that students enjoyed learning because the teaching included variations and challenges in order to make them explore the material's deeply felt meaning (item 25) and that students felt focused because the instruction provided a variety of activities which required intuition, insight, creativity, or imagination (item 29).

Table 5c. Means of Responses to Attitudes about the Features of Curriculum and Instruction (items=37-44)

Items		Means
37	I felt relaxed because I was not forced to produce anything until I felt and got ready (e.g., the vocabulary assignment).	4.83
38	I felt motivated because the learning was a process of creative construction and it involved trial and error (e.g., students had the opportunity to rewrite their work).	4.91
39	I liked to use the language structures meaningfully and appropriately in the lessons (such as in roleplays, or during writing activities).	4.26
40	I liked the lessons' encouraging me to become sensitive about what language is and how language works (by activities such as sample essay finding, or essay analyses).	4.52
41	I felt motivated because the course content was designed from a theme-based point of view so that interesting themes gave us a basis for understanding and acquiring new language structures and patterns.	4.52
42	I liked the activities such as drama that required using the language as well as the activities such as essay analysis that required talking about the language.	4.26
43	I liked the course materials' giving me time and chance to reflect on my own concerns, perceptions, and values in comparison with those of others, encouraging personal growth, and inviting empathy and sharing between us.	4.78
44	Learning was fun because studying, responding to and producing the course materials all led me to both sharpen my observational and evaluation skills and see the possibilities of new relationships between bits of information.	4.78
	Average	**4.48**

In addition, for items 20, 23 and 26 (all in Table 5a), the mean scores were found to be 4.57, which shows that students thought learning was fun because the teacher provided opportunities for their expression and engagement of emotions through various classroom activities (item 20), that they enjoyed learning because they were encouraged to construct their own meaning rather than being presented with a linear, planned, piece-by-piece presentation of language and content (item

23), and that they liked the teacher's providing them with opportunities for tasks to review old materials (item 26).

Furthermore, the mean score 4.52, a score very close to the mean 4.48, was obtained for items 40 and 41 (both in Table 5c), which shows that students liked the lessons' encouraging them to become sensitive about what language is and how language works (item 40) and that students felt motivated because the course content was designed from a theme-based point of view so that interesting themes gave them a basis for understanding and acquiring new language structures and patterns (item 41).

For item 22 (in Table 5a), the mean score was the same as the average mean, that is 4.48, which indicates that the students felt both relaxed and fully in control because they were able to set their own goals and make use of their background knowledge. Likewise, 4.43 was the mean score for items 18 and 24 (both in Table 5a), which shows that the students enjoyed learning about emotions and the emotional intelligence (item 8), and that they liked to organize and practice newly learned material on their own (item 24). 4.39 was the mean score obtained for item 28 (in Table 5b), which indicates that students felt both alert and receptive because the instruction involved some kind of suddenness, loudness, contrast, novelty, creativity-seeking or movement-related activities. Moreover, 4.30 was the mean score for items 19 (in Table 5a), 30 (in Table 5b) and 31 (in Table 5b), which indicates that students liked learning about Maslow's hierarchy of needs to become aware of their own needs (item 19), that they felt both relaxed and fully in control because they were able to make use of their background knowledge (item 30), and

that they felt motivated because the lessons required the use of metaphors, stories, role-playing, movements, discussion, and drawing (item 31).

Besides, 4.26 was the mean score gained for items 36 and 42 (both in Table 5c), which shows that students liked to use the language structures meaningfully and appropriately in the lessons (item 36), and that they liked the activities such as drama that required using the language as well as the activities such as essay analysis that required talking about the language (item 42). The mean score for item 35 (in Table 5b) was 4.22, which indicates that students felt positively challenged because activities that required the use of computer, internet, authentic magazines or newspapers took place in the classroom.

The lowest mean score for this section is 4, though still a positive score, given to item 21 (in Table 5a), which indicates that students felt confident to participate in all the activities including drama, games, discussions, debates, reflection about personal issues, and celebrations. Close to this score, 4.04 was the mean score obtained for item 27 (in Table 5b), which indicates that students felt alert in the lessons because they were scheduled between 9:00 a.m. and 13:00 p.m. Likewise, 4.09 was the mean score gained for item 32 (in Table 5b), which indicates that students felt motivated because they participated in meaningful and challenging lessons that invoked their curiosity and search for meaning.

In Table 6a, Table 6b, and Table 6c below, the frequency and the percentages of the students' responses are displayed and then they are explained. Table 6a presents the frequency and the percentages for items from 17 to 26; Table 6b presents the frequency and the percentages for items from 27 to 36; Table 6c presents the frequency and the percentages for items from 37 to 44.

The results presented in Table 6a, Table 6b, and Table 6c indicate that all of the 23 students liked the contents through which they learned the language (item 17 in Table 6a), that all of them found learning fun because the teacher provided opportunities for their expression and engagement of emotions through various classroom activities (item 20 in Table 6a) and because the lessons reflected a natural connection to real-life experiences (item 34 in Table 6b), that they all felt motivated because the learning was a process of creative construction and it involved trial and error (item 38 in Table 6c), and that a hundred per cent of the students thought learning was fun because studying, responding to and producing the course materials all led them to both sharpen their observational and evaluation skills and see the possibilities of new relationships between bits of information (item 44 in Table 6c).

Table 6a. Students' Responses to Attitudes about the Features of Curriculum and Instruction (items=17-26)

	Curriculum and Instruction/a									
	5		**4**		**3**		**2**		**1**	
Items	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
17	15	65	8	35	---	---	---	---	---	---
18	13	57	7	30	3	13	---	---	---	---
19	11	48	9	39	2	9	1	4	---	---
20	13	57	10	43	---	---	---	---	---	---
21	6	26	11	48	6	26	---	---	---	---
22	13	56	8	35	2	9	---	---	---	---
23	14	61	8	35	1	4	---	---	---	---
24	11	48	11	48	1	4	---	---	---	---
25	15	65	7	31	1	4	---	---	---	---
26	14	61	8	35	1	4	---	---	---	---

In addition, the results revealed that 96 % of the students felt that they enjoyed learning because they were encouraged to construct their own meaning rather than being presented with a linear, planned, piece-by-piece presentation of language and content (item 23 in Table 6a), that they liked to organize and practice the newly learned material on their own (item 24 in Table 6a), that they enjoyed learning because the teaching included variations and challenges in order to make them explore the material's deeply felt meaning (item 25 in Table 6a), and that they liked the teacher's providing them with opportunities for tasks to review old materials (item 26 in Table 6a). Besides, none of the students had a negative attitude about the features mentioned in items 23, 24, 25, and 26.

Table 6b. Students' Responses to Attitudes about the Features of Curriculum and Instruction (items=27-36)

	Curriculum and Instruction/b									
	5		**4**		**3**		**2**		**1**	
Items	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
27	7	30	12	52	2	9	2	9	---	---
28	12	52	9	39	1	5	1	4	---	---
29	15	65	7	31	1	4	---	---	---	---
30	11	48	9	39	2	9	1	4	---	---
31	9	39	12	52	2	9	---	---	---	---
32	9	39	7	31	7	30	---	---	---	---
33	16	70	6	26	1	4	---	---	---	---
34	19	83	4	17	---	---	---	---	---	---
35	9	39	10	43	4	18	---	---	---	---
36	16	70	6	26	1	4	---	---	---	---

Again, 96 % of the students think that they felt focused because the instruction provided a variety of activities which required intuition, insight, creativity, or imagination (item 29 in Table 6b), that they enjoyed learning because

the instruction involved various strategies to reach all seven intelligences (item 33 in Table 6b), that they felt both motivated and receptive because the instruction was at or just above their proficiency level (item 36 in Table 6b), that they felt relaxed because they were not forced to produce anything until they felt ready (item 37 in Table 6c), and that they liked the course materials' giving them time and chance to reflect on their own concerns, perceptions and values in comparison with those of others, encouraging empathy and sharing between them (item 43 in Table 6c). Besides, none of the students had a negative attitude about the features mentioned in items 29, 33, 36, 37, and 43.

Table 6c. Students' Responses to Attitudes about the Features of Curriculum and Instruction (items=37-44)

	Curriculum and Instruction/c									
	5		**4**		**3**		**2**		**1**	
Items	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
37	20	87	2	9	1	4	---	---	---	---
38	21	91	2	9	---	---	---	---	---	---
39	10	44	10	43	2	9	1	4	---	---
40	14	61	7	30	2	9	---	---	---	---
41	14	61	7	30	2	9	---	---	---	---
42	9	39	11	48	3	13	---	---	---	---
43	19	83	3	13	1	4	---	---	---	---
44	18	78	5	22	---	---	---	---	---	---

Furthermore, 91 % of the students stated that they felt both relaxed and fully in control because they were able to set their own goals and make use of their background knowledge (item 22 in Table 6a), that they felt motivated because the lessons required the use of metaphors, stories, role-playing, drawing, discussions, or debates (item 31 in Table 6b), that they liked the lessons' encouraging them to

become sensitive about what language is and how language works (item 40 in Table 6c), and that they felt motivated because the course content was designed from a theme-based point of view so that interesting themes gave them a basis for understanding and acquiring new language structures and patterns (item 41 in Table 6c). Besides, none of the students had a negative attitude about the features mentioned in items 22, 31, 40, and 41. On the other hand, for item 28 (in Table 6b), only one student, that is 4 % of the students, felt that the instruction's involving some kind of suddenness, loudness, novelty, contrast, movement-related or creativity-seeking activities did not make him feel alert and receptive, while 91 % of the students had a positive attitude about this feature of the instruction.

Moreover, 87 % of the students thought that they enjoyed learning about emotions and the emotional intelligence (item 18 in Table 6a) and that they liked the activities such as drama that required using the language as well as the activities such as essay analysis that required talking about the language (item 42 in Table 6c), while none of the students had a negative attitude about the features mentioned in items 18 and 42. For items 19 (in Table 6a), 30 (in Table 6b) and 39 (in Table 6c), only 4 % of the students stated that they had a negative attitude towards learning about Maslow's hierarchy of needs to become aware of their needs (item 19), that they did not feel relaxed and fully in control by making use of their background knowledge (item 30), and that they did not like to use language structures meaningfully and appropriately in the lessons (item 39). However, 87 % of the students stated that they had positive attitudes about the features mentioned in items 19, 30, and 39.

In addition to these, 82 % of the students thought that they felt positively challenged because activities that required the use of computer, internet, authentic magazines or newspapers took place in the classroom (item 35 in Table 6b), and that they felt alert in the lessons because they were scheduled between 9:00 a.m. and 13:00 p.m. (item 27 in Table 6b) while only one student –that is 4 % of the students- stated a negative attitude about the feature mentioned in item 27. Besides, 74 % of the students stated that they felt confident to participate in all the activities including drama, games, discussions, debates, reflection about personal issues, and celebrations (item 21 in Table 6a) and none of the students had a negative attitude about this feature of curriculum and instruction. Finally, 70 % of the students thought that they felt motivated because they participated in meaningful and challenging lessons that invoked their curiosity and search for meaning (item 32 in Table 6b) and none of the students stated a negative attitude about this feature of curriculum and instruction.

Consequently, the results obtained for the third section of the questionnaire show that students had highly positive attitudes towards the features of curriculum and instruction in the brain-based English composition course. Particularly, they liked the kind of contents and activities that require using the language as well as talking about it and using internet, computer, and authentic texts and that require creativity, intuition, or imagination to activate the right brain as much as the left brain and to excite the reticular activation system and keep the students alert.

Besides, they liked to explore and expand their ways of thinking, sharpen their observational and evaluation skills, make use of their background knowledge, review old materials, make connections to real-life experiences, reflect on their own

concerns, perceptions and values while studying, reponding to and producing the course materials so that they can creatively construct their own meaning out of the contents being studied. Moreover, they enjoyed learning about their needs and emotions and liked being able to express their emotions during the lessons.

D. Section 4: Attitudes towards the Features of Assessment Techniques and Procedures

The fourth section of the questionnaire focuses on students' attitudes towards the features of assessment techniques and procedures in the brain-based English composition course. In Table 7 below, students' mean scores obtained for each item in this section are presented. This section has the highest mean score –4.96- among the four sections of the questionnaire. The average mean, 4.80 out of 5, is again the highest average mean across the four sections of the questionnaire and can be interpreted as students' having highly positive attitudes towards the features of assessment techniques and procedures.

In this section, the highest mean score 4.96 was obtained for item 51, which indicates that students liked the assessment techniques because they encouraged them to reflect on their performance and progress. This means that students had a great desire to become clear about what their resulting performance was like everytime they produced something. The second highest mean score was 4.91 and was obtained for items 45, 49 and 52, which shows that students liked the teacher's use of rubrics/checklists to show the required level of performance (item 45), that they liked the teacher's assessment techniques because they provided multiple sources of evaluation and gave an in-depth view of their progress (item 49), and that

they liked the assessment techniques' providing them with specific, immediate, personal, and detailed feedback about their performance (item 52).

Table 7. Means of Responses to Attitudes about the Features of Assessment Techniques and Procedures

Items		Means
45	I liked the teacher's use of rubrics/checklists to show the required level of performance.	4.91
46	I felt motivated because the teacher emphasized that no student would be left without reaching the required level of mastery.	4.48
47	I felt comfortable because the teacher preferred process-oriented testing techniques such as rubric, checklist, observation, portfolio, and self-evaluation.	4.87
48	I felt both relaxed and motivated because the teacher's assessment considered the multiple ways I processed information and the multiple ways by which I could demonstrate my performance (multiple intelligences).	4.48
49	I liked the teacher's assessment techniques because they provided multiple sources of evaluation and gave an in-depth view of my progress.	4.91
50	I felt confident because the assessment procedures showed my processes and improvement over time, and provided extended product revisions (such as rewrite and review sessions).	4.87
51	I liked the assessment techniques because they encouraged me to reflect on my performance and progress.	4.96
52	I liked the assessment techniques' providing me with specific, immediate, personal, and detailed feedback about my performance.	4.91
	Average	**4.80**

The third highest mean score 4.87 was obtained for items 47 and 50, which depicts that students felt comfortable because the teacher preferred process-oriented testing techniques such as rubric, checklist, observation, portfolio, and self-evaluation (item 47), and that students felt confident because the assessment procedures showed their processes and improvement over time and provided extended product revisions (item 50). Finally, the lowest mean score 4.48, though still reflecting a highly

positive attitude, was obtained for items 46 and 48, which indicates that students felt motivated because the teacher emphasized that no student would be left without reaching the required level of mastery (item 46), and that students felt both relaxed and motivated because the teacher's assessment considered multiple ways they processed information and the multiple ways by which they could demonstrate their performance (item 48).

In Table 8 below, the frequency and the percentages of students' responses are displayed and then they are explained.

Table 8. Students' Responses to Attitudes about the Features of Assessment Techniques and Procedures

	Assessment Techniques and Procedures									
	5		**4**		**3**		**2**		**1**	
Items	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
45	21	91	2	9	---	---	---	---	---	---
46	12	52	10	44	1	4	---	---	---	---
47	20	87	3	13	---	---	---	---	---	---
48	13	57	8	34	2	9	---	---	---	---
49	21	91	2	9	---	---	---	---	---	---
50	20	87	3	13	---	---	---	---	---	---
51	22	96	1	4	---	---	---	---	---	---
52	21	91	2	9	---	---	---	---	---	---

The results presented in Table 8 indicate that a hundred per cent of the students had positive attitudes towards the features mentioned in items 45, 47, 49, 50, 51, and 52. That is, all the students liked the teacher's use of rubrics/checklists to show the required level of performance (item 45); they felt comfortable because the teacher preferred process-oriented testing techniques such as rubric, checklist, observation, portfolio, and self-evaluation (item 47); they liked the teacher's assessment techniques because they provided multiple sources of evaluation and

gave an in-depth view of their progress (item 49); they felt confident because the assessment procedures showed their processes and improvement over time and provided extended revisions (item 50); they liked the assessment techniques because they encouraged them to reflect on their own performance and progress (item 51); students liked the assessment techniques' providing them with specific, immediate, personal, and detailed feedback about their performance (item 52).

Besides, 96 % of the students stated that they felt motivated because the teacher emphasized that no student would be left without reaching the required level of mastery (item 46), and none of the students had a negative attitude about this feature of assessment techniques and procedures. Moreover, 91 % of the students thought that they felt both relaxed and motivated because the teacher's assessment considered the multiple ways they processed information and the multiple ways by which they could demonstrate their performance (item 48), and none of the students had a negative attitude about this feature of assessment techniques and procedures.

On the whole, the results obtained for the fourth section of the questionnaire indicate that students had highly positive attitudes towards the features of assessment techniques and procedures. Particularly, they liked the assessment techniques' encouraging them to reflect on their performance and progress, providing them with specific and detailed feedback about their performance, showing an in-depth view of their improvement over time and being process-oriented. Besides, they liked to know the required level of performance for every task before they actually do it.

For the ease of interpretation, Figure 14 below shows the responses (5 Strongly Agree, 4 Agree, 3 Undecided, 2 Disagree, 1 Strongly Disagree) given by the students for the 52-item attitude questionnaire in a column-chart.

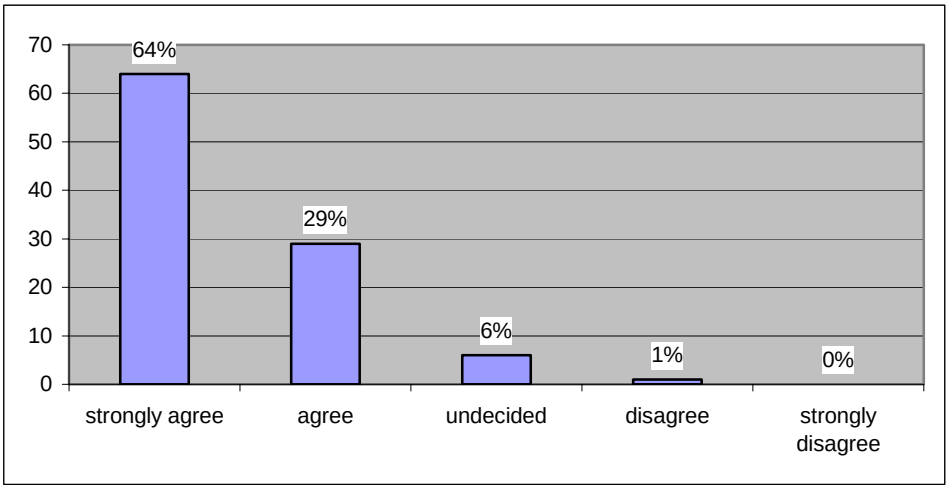

Figure 14. Percentages of Students' Responses to the Attitude Questionnaire

While interpreting this figure, responses 4 and 5 are considered as positive, 3 as undecided, and 1 and 2 as negative; and their percentages are summed to indicate the representation of students' responses. Thus, it is seen from Figure 14 above that 93 % of the students had positive attitudes towards the brain-based applications in the English composition course while only 1 % of the students had negative attitudes towards the brain-based applications.

4.2 Analysis of Qualitative Data

In this study, the qualitative data were collected through student interviews which were conducted with 10 students at the end of the study and one week after the administration of the attitude questionnaire.

4.2.1 Analysis of the Interviews

In this study, responses to the interview questions were analyzed via cross-case analysis. That is, the common answers given by the students were listed to identify the general tendencies.

To analyze the interviews, first the interviews were transcribed. Later, each response for the questions was analyzed and grouped under related headings. Finally, the results were presented in frequency tables.

It should be noted that the real names of the interviewees and the extracts from the interviews are presented with the permission of the interviewees. Moreover, if the quotations borrowed from the students were in Turkish, they were translated into English by the researcher and backtranslated by two of her colleagues who are also teachers of English in the Department of Foreign Language Education at METU, just like the researcher herself.

4.2.2 The Results of the Interviews

There were 8 questions in the interview (see Appendix H for the interview questions). The first question "What are your feelings about the kind of experiences you have gone through in this composition course?" included four subquestions: "What are your feelings about the kind of experiences related with the features of physical setting/environment?", "What are your feelings about the kind of experiences related with the features of teacher-student roles and interaction?", "What are your feelings about the kind of experiences related with the features of curriculum and instruction?", "What are your feelings about the kind of experiences

related with the features of assessment techniques and procedures?" These questions aimed at finding out information about how the brain-based classroom applications were experienced by the students.

Table 9 below demonstrates the results for the first subquestion of the first question, "What are your feelings about the kind of experiences related with the features of physical setting/environment?"

Table 9. The Results of the Interview Question 1a (Students' feelings about the features of physical setting/environment)

Music in the background, spacious room, fresh air, and pleasant smells all…	**Frequency**
made me feel comfortable	3
refreshed me	3
kept me awake	3
made me feel relaxed	2
helped me to concentrate	2
were very stimulating	1

As it is seen in Table 9, subjects found the environment comforting and relaxing mostly. To illustrate, Ayşenur explained why she felt comfortable and refreshed as follows: "Because of the working space, music, and fresh air, I felt comfortable and I was attentive during the lessons. I liked doing all the activities and participating in the lessons". Another student, Meral revealed: "The physical setting was very refreshing and stimulating. Although I don't like writing in general, in this course I felt motivated to write". Again, Sezer stated that he could overcome his concentration problems with the help of the comforting and relaxing features of the physical setting.

On the whole, all of the 10 students who were interviewed had positive feelings about the features of physical setting/environment they had been exposed to during the composition course.

Table 10 below shows the results for the second subquestion of the first question, "What are your feelings about the kind of experiences related with the features of teacher-student roles and interaction?"

Table 10. The Results of the Interview Question 1b (Students' feelings about the features of teacher and student roles and interaction)

I felt relaxed and confident because…	**Frequency**
the teacher was tolerant and flexible	5
the teacher had a positive attitude towards us	3
the teacher valued us	2
the teacher considered and treated us as individuals	1
the teacher was fair and gave everyone an equal chance	1
the teacher provided constructive feedback	1

Table 10 indicates five out of 10 interviewees stated that they felt relaxed and confident because of the teacher's being tolerant and flexible. For instance, Meral explained: "You were tolerant and let us write when we felt ready. For example, during the in-class writing sessions/the exams, you told us that we could write our essays on another day if we didn't feel ready and comfortable". As for Nazlı, she expressed: "Because you were tolerant, I could speak more comfortably in the class". Moreover, Müberra revealed: "Your attitude towards us was very different from that of other teachers. You considered and treated us as individuals and you valued us, our opinions, and our feelings. All these made us feel relaxed and

confident". In addition, Murat stated: "Because you were fair and gave everyone an equal chance for expressing himself, I felt confident enough to participate and express my ideas", while Meryem expressed: "Because of your constructive feedback, I felt confident and could express my ideas better".

Finally, all of 10 students had positive feelings about the teacher-student roles and interaction in general.

Table 11 below displays the results for the third subquestion of the first question, "What are your feelings about the kind of experiences related with the features of curriculum and instruction?"

Table 11. The Results of the Interview Question 1c (Students' feelings about the features of curriculum and instruction)

I liked the course contents and activities and found them useful because…	**Frequency**
they prepared me well before I actually started to produce	6
various techniques (such as roleplays, drawing, questioning, presentations, or audio-visual support) were used by the teacher to attract our attention	5
the lessons were well-planned by the teacher	4
we discussed and analysed the topics as a whole class	3
they helped me to improve my organizational skills	3
we examined good samples in the class	2
I could learn from my friends/classmates	2
the lessons were interesting, attractive, and enjoyable	2
they went very smoothly from basic toward complicated tasks	1
the handouts were very useful	1
I could practice the subjects I learned a lot	1
they helped me to learn during the lesson	1
I could achieve even very challenging tasks gradually	1

As it is seen in Table 11, six out of 10 students replied that they liked the course content and activities and found them useful because they prepared them well before they actually started to write. To illustrate, Müberra expressed: "Everything went in a well-organized fashion. First we learned about what writing is and how we can write. Then we were informed about different writing styles. After discussing and analyzing the elements of each style on good samples, as a whole class, we worked on examples to produce outlines. We waited long enough before we were actually expected to write. This was really efficient and helpful". Moreover, Hatice revealed: "All the activities we did –roleplays, teacher's explanations, drawing, etc.- helped us to comprehend the topics better before we started to write on our own. So, I felt satisfied with my learning".

Again, Table 11 indicates that five out of 10 students stated that various techniques such as roleplays, drawing, questioning, presentations, audio-visual support, and discussions were used to attract their attention. For instance, Ayşenur explained: "We didn't study the topics in a monotonous way. You always attracted our attention by roleplays, drawing, feedback, group work, and challenging tasks. And I liked drawing most". In addition, Zeynep reflected: "In fact, I don't like being restricted by rules while writing. But in this course, writing within the rules was also enjoyable because of the interesting course content and audio-visual support".

Furthermore, Table 11 depicts that four out of 10 students thought that lessons were well-planned, while three out of these 10 students stated that it was useful to discuss and analyze the topics as a whole class. Besides, three out of 10 students liked the course contents and activities and found them useful because they helped them to improve their organizational skills which they could use in their

other courses such as Turkish or Spoken English. Finally, sample analyses, group work, handouts and practicing a lot were found to be useful by some of the students.

On the whole, none of the 10 students demonstrated negative attitudes about the features of curriculum and instruction.

Table 12 below demonstrates the results for the fourth subquestion of the first question, "What are your feelings about the kind of experiences related with the features of assessment techniques and procedures?"

Table 12. The Results of the Interview Question 1d (students' feelings about the features of assessment techniques and procedures)

Answers		**Frequency**
I liked your specific, detailed, and personal feedback because...	I could correct my mistakes accordingly.	5
	it was constructive.	4
	it helped me to see what I did correctly and my progress.	3
	it motivated me to write better.	1
I liked rewrite opportunities because I could learn from my mistakes.		10
I liked teacher's various assessment techniques (such as journals, essays, roleplays, observation, or portfolio) because I could express myself in multiple ways and they helped me to improve.		8
I liked reviews because I learned about others' views and their products and I could learn from my friends/classmates.		6
I enjoyed doing all of the assignments.		4

Table 12 reflects that students mostly focused on the feedback and they provided very detailed explanations about it. It is seen that five out of 10 students liked the teacher's specific, detailed and personal feedback because they could correct their mistakes accordingly, while four of them stated that they liked the

feedback because it was constructive. For example, Hatice revealed: “Feedback showed what I needed to improve. The work’s moving between you and the teacher until you achieve your best is something really important”.

Moreover, eight out of 10 students stated that they liked the teacher’s employment of various assessment techniques because they helped them to improve. In addition, six out of 10 students pointed out that they liked reviews because they learned about others’ views and their products and they could learn from each other. All of the students liked to have rewrite opportunities, while half of them stated that they enjoyed doing all of the assignments.

Thus, on the whole, none of the students who were interviewed had negative attitudes about the features of assessment techniques and procedures.

The second question “How did taking this composition course make you feel? Explain” aimed at identifying how students felt in response to taking this composition course and why they felt the way they felt. Table 13 shows the answers given by the 10 students for this question.

As Table 13 demonstrates, students’ responses for the second question can be classified into three categories: confident, relaxed, and valued. First, all of the 10 students stated that taking this composition course made them feel confident. The students’ reasons for feeling that way were various. Four of the 10 students expressed that it was because they learned a lot of things about writing, while two of them related this to the teacher’s comments in the feedback. Moreover, two of the students felt confident because they could express themselves by writing and two of them felt so because they did their best.

Table 13. The Results of the Interview Question 2

Answers		**Frequency**
I felt confident because...	I learned a lot of things about writing.	4
	the teacher's comments in the feedback made me feel so.	2
	I could express myself by writing.	2
	I did my best.	2
I felt relaxed because...	there was a comforting atmosphere in the class.	4
	I was not afraid of the teacher.	3
	there was a positive and constructive interaction among the class members.	2
I felt valued because...	the lessons appealed to my interests.	3
	the teacher listened to our views and responded to them sincerely.	2
	I was never ignored.	2

Second, eight out of 10 students felt relaxed according to Table 13. Half of the eight students felt so because there was a comforting atmosphere in the class, while three of them felt so because they were not afraid of the teacher. Besides, two out of the eight students felt relaxed because there was a positive and constructive interaction among the class members.

Finally, six out of the 10 students felt valued by taking this composition course according to Table 13. Three out of these six students felt this way because the lessons appealed to their interests, while two of them felt so because they were never ignored during the lessons. Again, two out of the six students felt valued because the teacher listened to their views and responded to them sincerely.

On the whole, taking this composition course resulted in positive feelings such as confidence, relaxation, or being valued in the students who were interviewed.

The third question "Did you like this composition course?" included two subquestions: "What specifically did you like?" and "What specifically did you dislike?" These questions aimed at finding out more information about students' likes and dislikes about the brain-based applications employed in this composition course. Table 14 below demonstrates the students' responses for this question.

Table 14. The Results of the Interview Question 3

"Did you like this composition course?"	
Answers	**Frequency**
Yes	10
No	0

As Table 14 shows all of the students expressed that they liked this brain-based composition course. Table 15 and 16 provide more detailed information about what specifically they liked and disliked.

As Table 15 presents, six out of the 10 students who were interviewed expressed that they specifically liked the activities such as journal writing, roleplays, portfolio, and group work. What Nazlı said is worth quoting: "I liked journal writing most because I liked to select articles to reflect on and write about my ideas and feelings in response to the articles. Not being forced to pay attention to grammar made me write more freely and this improved me a lot. It developed my writing and thinking skills at the same time. This makes me feel confident about writing".

Moreover, since these students were prospective teachers, they found certain activities very important for their professions in the near future. To illustrate, Müberra stated: "I liked portfolio most because it is very important for my future life and I can review my learning by referring to it".

Table 15. The Results of the Interview Question 3a

I specifically liked…	**Frequency**
the activities such as journal writing, roleplays, portfolio, and group work	6
learning how to write	5
the teacher's feedback	4
the teacher's positive attitude towards us	3
the interaction and communication between the teacher and us and among us	1
the active use of our ideas, emotions, creativity, and imagination	1
learning about the emotional intelligence and Maslow's hierarchy of needs	1

Furthermore, five out of the 10 students stated that they liked learning how to write, while four of them revealed that they liked the teacher's feedback most. In addition, three of the 10 students emphasized that they liked the teacher's positive attitude towards them. The kind of interaction and communication among the class members, the involvement of students' opinions, feelings and creativity, and learning about the emotional intelligence and hierarchy of needs were also addressed as points that were liked by the students.

On the other hand, Table 16 below displays the students' answers about what they specifically disliked.

Table 16. The Results of the Interview Question 3b

I specifically disliked…	**Frequency**
sample essay analyses	2
the lessons' starting at 8:40	1
the time pressure while writing in the class	1
review sessions	1
writing according to the rules (formal writing)	1

As it is seen in Table 16, two out of 10 students did not like analyzing the sample essays brought by their friends to the class because they (Müberra and Nazlı) found them boring. Besides, Meryem did not like the course's starting at 8:40 in the morning. In addition, Fatma stressed that she felt tense because of the time pressure while writing in the class. However, she added that because the teacher allowed her to write at some other time if she felt nervous, she could get relieved and write when she felt ready. Moreover, although Sezer found reviews difficult and thus did not like them, he revealed that the teacher's provision of a checklist for him to use while reviewing his friend's work helped him a lot. Finally, Zeynep emphasized that she sometimes did not want to write according to the rules (formal writing); however, she added that the presence of journal writing made her happy to some extent.

The fourth question "Have you found composition writing meaningful and relevant to you? Explain" aimed at identifying whether they found composition writing meaningful and relevant to themselves and, if so, whether the brain-based applications had any contribution to that. Table 17 shows the students' answers for this question.

Table 17. The Results of the Interview Question 4

I have found composition writing meaningful and relevant to me because…	**Frequency**
writing is necessary for a person to be able to express his ideas in an organized, concise, and compact manner	5
I need to know how to write/express myself appropriately	3
I like to express and relax myself by writing and thus the product is purposeful and meaningful	3
writing is necessary as a tool for revising my learning	2
the topics we read/wrote about were relevant to me and my daily life	2

First of all, all of the students stated that they had found writing meaningful and relevant to themselves. As for the resons for thinking that way, Table 17 indicates that five out of 10 students found writing meaningful and relevant because it was necessary for them to be able to express themselves in an organized, concise, and compact manner. What Nazlı said is worth quoting: "Yes. I realized this while preparing a take-home exam for my Short Story course. I read a lot of things and I could express what I learned in an organized and compact way. I could transfer my writing ability to another course and this showed me that writing is very meaningful for us".

In addition, three out of the 10 students stated that they found writing meaningful and relevant because they liked to express and relax themselves by writing. To illustrate, Zeynep said: "Yes, writing is meaningful because I spend a lot of time and effort and produce something. It is my own creation, so that product is very meaningful". Besides, two out of the 10 students found writing meaningful and relevant because they used it as a tool for revising their learning, while another two

thought that way because they found the topics relevant to themselves and to their daily lives.

The fifth question was “What are the skills you have acquired in this course?” This question aimed at identfying the skills they thought they had acquired during the course. Table 18 below presents the students’ answers for this question.

As it is indicated in Table 18, the skills the students have acquired in this brain-based composition course can be classified into five broad categories: writing skills, computer skills, teaching skills, the emotional intelligence, and the hierarchy of needs. First, all of the 10 students stated that they learned essay writing and various essay types. In addition, eight out of the 10 students developed organizational skills, while seven of them stated to have learned journal writing. Besides, six out of 10 students revealed that they learned critical thinking and thinking through multiple perspectives.

Furthermore, four of the 10 students stated that they learned how to do research on internet, while two of them stated to have learned how to prepare a document on the computer.

Moreover, since the subjects of this study were prospective teachers, they paid special attention to the teaching skills employed by the teacher of this course and thus they acquired such skills as well in an implicit manner. As a result, as for the teaching skills, eight of the 10 students stated that they learned about employing roleplays, drawing, presentations, internet research, and projects in the lessons. Besides, three out of 10 students stated to have acquired making use of students’ creativity and imagination, while one of the students revealed that he learned how to

make use of students' background knowledge. Lastly, three out of 10 students think that they acquired the skill of arranging the physical environment appropriately.

Table 18. The Results of the Interview Question 5

I have acquired…		
Answers		**Frequency**
writing skills such as…	essay writing	10
	various essay types	10
	organization	8
	journal writing	7
	critical thinking and thinking through multiple perspectives	6
	various modes of development (description, narration, comparison, exposition etc.)	3
	project design	3
	creativity and imagination	2
computer skills such as...	internet research	4
	preparing a document on the computer	2
teaching skills such as...	employing roleplays, drawing, presentations, internet research, projects, and journals	8
	making use of students' creativity and imagination	3
	arranging the physical environment	3
	making use of students' background knowledge	1
how to manage my emotions and relationships (the emotional intelligence)		5
how to be aware of my needs and the importance of satisfying them (the hierarchy of needs)		5

Finally, five out of the 10 students expressed that they learned how to manage their emotions and relationships (the emotional intelligence), while five out

of these students stated that they had become more aware of their needs and the importance of satisfying them (the hierarchy of needs).

In relation to the previous (fifth) question which asked the skills the students had acquired in this composition course, the sixth question "Do you believe you will use the skills you have acquired in this composition course in the future? Explain" aimed at finding out whether they valued the skills they had acquired during the course and whether these skills would be part of them through the rest of their lives from their own point of view. Table 19 below demonstrates the answers for this question.

Table 19. The Results of the Interview Question 6

I believe I will use all the skills I have acquired in this composition course…	**Frequency**
as part of my profession as a teacher in the future	9
as a student (in my second, third and fourth years in my department)	4
throughout my life	3

First of all, all the students believe that they will use all the skills they have acquired in this brain-based composition course in the future. As Table 19 indicates, nine out of the 10 students who were interviewed stated that they would use those skills in the future as part of their profession as teachers, while four of the students believed that they would use the skills they had acquired in this course in their second, third and fourth years at their department as students. Besides, three out of the 10 students expressed that they would use all those skills throughout their lives in all fields of life.

The seventh question "What are your opinions about how writing skills should be taught based on your experiences in this composition course?" aimed at identifying what aspects of the composition course they liked most and considered as essential elements of a writing course. Table 20 below depicts the students' answers for this question.

Table 20. The Results of the Interview Question 7

Based on my experiences in this composition course, I think writing skills should be taught by…	**Frequency**
well-planned lessons which involve a variety of activities such as roleplays, drawing, discussions, sample essay analyses, and reviews	6
arranging the physical environment in such a way that a positive atmosphere for learning can be created (music, fresh air, spacious room)	4
employing various assessment techniques such as projects, checklists, observation, portfolio, journals, and rewrite sessions	4
addressing issues from daily life (such as journals and projects)	3
a lot of practice	3
providing specific and detailed feedback	3
a teacher who is tolerant and flexible	3
a teacher who is interested and caring	2
a teacher who values the students' opinions and feelings	2

As Table 20 indicates, six out of the 10 students think that the writing skills should be taught by preparing well-planned lessons which involve a variety of activities such as roleplays, drawing, discussions, sample essay analyses, and reviews. Moreover, four of the 10 students indicate that arranging a physical environment -considering the issues of music, air, and space- that is conducive to learning is very important, while four of the students believe that the teacher should employ various assessment techniques such as projects, checklists, observation,

portfolio, journals, and rewrite sessions. Besides, three students think that topics/themes should be selected from daily issues, and another three believe that a lot of practice is required. Furthermore, while three of the 10 students state that the teacher should provide specific and detailed feedback, another three believe that the teacher should be tolerant and flexible.

Finally, two of the 10 students emphasized the importance of the teacher's interest in them and caring attitude, while another two focused on the importance of the teacher's valuing students' opinions and feelings.

The eighth question "If you were given such a chance, what changes would you make in this composition course?" aimed at receiving suggestions from the subjects in order to revise the brain-based applications for the future use. Table 21 below shows the students' answers for this question.

Table 21. The Results of the Interview Question 8

If I were given such a chance, I would…	**Frequency**
make no change in this course	7
increase the weekly number of hours for the composition course	3

As Table 21 indicates, the majority (7) of the subjects who were interviewed did not want to make any changes in this brain-based composition course. On the other hand, three out of the 10 students wanted to increase the weekly number of hours for this composition course because they thought considering the course load 3 hours a week was not enough. Furthermore, they suggested six hours weekly

allocated for the composition course and advised to spread the lessons across the week so that the links between the lessons would be stronger.

4.3 Summary of Significant Results

The analysis of the quantitative and the qualitative data revealed that students had significant positive attitudes towards the brain-based applications in the English composition course.

According to the results of the attitude questionnaire which collected the quantitative data, 93 % of the students had positive attitudes towards the brain-based applications in the course while only 1 % of the students had negative attitudes about the brain-based applications. When the responses were examined, it was found that these negative responses were given for item 5 (one person) which indicated that Baroque and/or classical music in the background did not make him/her feel relaxed and alert, for item 19 (one person) which showed that he/she did not like learning about Maslow's hierarchy of needs, for item 27 (two students) which revealed that having the lessons between 9:00 a.m. and 13:00 p.m. did not make them feel alert, for item 28 (one person) which showed that he/she did not feel alert and receptive in response to the instruction which involved some surprise effect, loudness, contrast, creativity, or novelty, for item 30 (one person) which demonstrated that being able to make use of his/her background knowledge did not make him/her feel relaxed and fully in control, and for item 39 (one person) which showed that he/she did not like to use language structures meaningfully and appropriately in the lessons (such as in roleplays, or during writing activities).

To collect the qualitative data and arrive at deeper information on students' attitudes towards the brain-based applications, interviews were also held. During the interviews the researcher tried to identify the reasons of students' attitudes and explore their opinions, likes and dislikes, suggestions and preferences about the brain-based practices in the English composition course.

On the whole, the results of the interviews conducted with 10 of the 23 subjects revealed that all of the students had positive feelings about the brain-based applications in the course. Thus, the results of the interviews confirmed the results of the questionnaire. In addition, they became confident about their writing skills and felt happy because of being valued during the lessons. All of them stated to have liked the course- particularly group work, journal writing, roleplays, portfolio, learning to write, teacher feedback, teacher-student interaction, and the class atmosphere, while only one or two students complained about doing sample analyses and reviews, formal writing, or the time of the lesson.

Furthermore, they valued the kinds of skills (writing skills, computer skills, teaching skills, emotional intelligence, and an awareness of needs) they had acquired during the course and all of them thought that they would use all those skills in the future.

Moreover, while describing the essential elements of an ideal writing course, all of the interviewees made references to the features of the composition course they had been exposed to as part of this study. Particularly, they emphasized the importance of well-planned lessons, using a variety of activities, multiple assessment techniques, teacher feedback, teacher's attitude, and practice.

Consequently, the majority of the interviewees did not suggest any changes in the design and features of the composition course, and the only suggestion proposed was to increase the weekly number of course hours from 3 to 6 and spread the lessons across the week.

CHAPTER V

CONCLUSION

5.0 Presentation

In this chapter, first the summary of the study is given. Second, the results are reviewed. Next, the assessment of the study is presented. Finally, the implications for further research are given.

5.1 Summary of the Study

This case study on students' attitudes towards brain-based applications was carried out in the English Composition II course with a group of 23 first year students at the Department of Foreign Language Education at Middle East Technical University in the second half of the 2002-2003 academic year. The researcher was involved in the study as the course designer and course instructor.

Accordingly, the main purpose of this study was to get a complete and in-depth understanding of the students' attitudes towards brain-based applications through their experiences in the English Composition II course.

As the first step of the study, the researcher/instructor conducted an extensive literature review on basic brain anatomy, neural activities, different parts of the brain and their functions, organization of the nervous system, endocrine

system, relevant brain research findings and brain-based learning. The literature review made it possible for the researcher to identify the features of brain-based applications and design a brain-based language teaching model. Afterwards, the researcher designed and taught the ten-week English Composition II course according to the principles and applications of the brain-based language teaching methodology/model she had previously developed.

In the next step of the study, the researcher prepared the data collection instruments to be used after implementing the course for investigating students' attitudes towards brain-based applications in the English Composition II course.

First, a questionnaire was developed by the researcher to reveal students' attitudes towards brain-based applications by making use of the features of brain-based language teaching as described by her model. Then, to study students' attitudes towards the brain-based applications in greater depth, the researcher prepared questions to be asked in the interviews.

In this study, two kinds of instruments were used to collect data: a questionnaire and an interview. After receiving composition/writing training with a brain-based methodology for ten weeks, all of the 23 students were given a questionnaire which aimed at identifying their attitudes towards brain-based applications in the English Composition II course. One week later, the researcher conducted the interviews with 10 of the 23 students separately to investigate students' attitudes towards brain-based applications in the course further in greater detail.

Then, the data gained from the questionnaire and the interviews were analyzed and interpreted to arrive at the answer for the research question and

subquestions which investigated students' attitudes towards brain-based applications in this course.

5.2 Results

This study intended to answer the following research question:

1. What are the students' attitudes towards brain-based applications in the English Composition II course?

In this respect, this study aimed to find answers to the following subquestions:

   a. What are the students' attitudes towards the features of physical setting/environment in the course?
   b. What are the students' attitudes towards the features of teacher-student roles and interaction in the course?
   c. What are the students' attitudes towards the features of curriculum and instruction in the course?
   d. What are the students' attitudes towards the features of assessment techniques and procedures in the course?

To answer the research question and its accompanying subquestions, an attitude questionnaire was designed and used and interviews were conducted.

The attitude questionnaire collected the quantitative data to answer the research question and subquestions on students' attitudes towards brain-based

applications with respect to the features of physical setting/environment, teacher-student roles and interaction, curriculum and instruction, and assessment techniques and procedures. The results of the data indicated that 93 % of the students showed significant positive attitudes towards the brain-based applications, while only 1 % of the students had negative attitudes towards the brain-based applications.

Particularly, in terms of the features of physical setting/environment, students' responses indicated that the majority of the students found learning in responsive, inviting, and stimulating settings fun and they felt relaxed and receptive as a result of the features of such settings. Only one student stated that the presence of Baroque and/or classical music in the background did not result in feelings of relaxation and alertness for him/her.

With respect to the features of teacher-student roles and interaction, the results of the data showed that all the students had highly positive attitudes and none of them stated a negative attitude. In more specific terms, they liked it very much when the teacher employed various strategies to appeal to their individual interests, helped them set goals for their learning, used empowering language and behaviour towards them, and guided their learning through her constructive and immediate feedback and close observation of their progress. They seemed to value these features to a great extent because they were happy with the emotional bond established between themselves and the teacher. In addition, although they liked both intrapersonal and interpersonal activities, they preferred intrapersonal activities to the interpersonal ones more. Such a preference might have resulted from their previous study habits because the traditional educational methodologies which they

were exposed to during earlier years of their education generally emphasized intrapersonal activities requiring limited or no interaction among students.

As far as the features of curriculum and instruction are concerned, the results of the data showed that students had highly positive attitudes. Particularly, they liked the kind of contents and activities that required using the language as well as talking about it and using internet, computer, and authentic texts and that require creativity, intuition, or imagination to activate the right brain as much as the left brain, and to keep the students alert. The underlying reason for such a like seemed to stem from the fact that the students found the contents relevant to their lives and that making use of their creativity and imagination satisfied them to a great extent.

In addition, they had positive feelings about the activities because such activities made them expand their ways of thinking, improve their critical observational skills, make real-life connections, and creatively construct their own meaning. This was caused by the feeling that they had become confident as a result of the skills they had acquired during the course. Besides, they felt that it was important to address emotions during the lessons as they got more familiar with the concepts of emotional intelligence and Maslow's hierarchy of needs.

However, several students had negative attitudes towards some features of curriculum and instruction. Particularly, one student stated to have disliked learning about Maslow's hierarchy of needs, another student did not like to use the language structures meaningfully and appropriately in the lessons, while two other students complained about the time of the lessons. In addition, one student did not think that being able to use his background knowledge made him feel relaxed and fully in control, and another student stated not to have felt alert and receptive as a result of

the instruction which involved some surprise effect, loudness, some contrast, novelty, or creativity.

In terms of the features of assessment techniques and procedures, the results of the data showed that all of the students had highly positive attitudes. Particularly, they liked the assessment techniques because they encouraged the students to reflect on their performance and progress, provided them with specific and detailed feedback about their performance. Besides, they liked to be assessed on checklists and rubrics with samples.

For this study, to collect the qualitative data and obtain more detailed information about students' feelings and opinions about the brain-based applications, 10 of the 23 subjects were interviewed. Different from the attitude questionnaire and in addition to investigating how students felt about the brain-based applications, the interview questions also aimed at revealing the reasons for students' feelings and exploring their opinions, likes and dislikes, suggestions and preferences about the brain-based practices.

First of all, the results of the interviews also showed that all of the students had positive feelings about the brain-based applications. They all felt comfortable, relaxed and motivated with the help of the features of the environment which they summarized as the music in the background, spacious room, fresh air, and pleasant smells. In addition, they were happy with the kind of teacher-student interaction that existed in the composition course because they felt confident and relaxed due to the teacher's tolerance, flexibility, fair and nonthreatening attitude, and constructive feedback. Furthermore, they liked the course contents and activities and found them useful. They presented various reasons for feeling this way: the contents and

activities prepared them well before they actually started to write, various activities attracted their attention, and it was useful to discuss and analyze the topics as a whole class. Finally, they liked to be assessed in multiple ways and to receive personal and detailed feedback from the teacher about their performance and progress. For instance, what Hatice said is worth quoting: "Feedback showed what I needed to improve. The work's moving between you and the teacher until you achieve your best is something really important".

On the whole, the results of the first question of the interview which focused on the students' feelings about the kinds of experiences they had gone through in the composition course revealed that all of the students had highly positive attitudes about the features of the brain-based applications and they presented sound reasons for the attitudes they had developed towards those applications. Consequently, the students' comments and explanations prove that students were highly attentive during the lessons because students spontaneously activated the multiple types of awareness including sensory awareness, generalized awareness, metacognitive awareness, and conscious recall as described by Churchland and Forber (1995).

The rest of the interview questions collected complementary data as to the students' opinions, likes and dislikes, suggestions and preferences about the brain-based practices to present the whole picture qualitatively in greater detail. Accordingly, the results indicated that taking this composition course resulted in highly positive feelings such as confidence, relaxation, or being valued in the students who were interviewed. This seemed to stem from the positive and constructive class atmosphere, or teacher's attitude, free expression of ideas and feelings in the class, teacher feedback, or well-prepared lessons. Likewise, all of the

students liked the course. They mostly liked the kinds of activities, writing, or teacher's feedback and attitude, while some of them liked the kind of interaction between the teacher and students and among the students, or learning about emotions and needs.

Thus, the kind of intrinsic motivation as described by Jensen (1998) could be attained by creating a positive climate, positive and productive emotions, specific feedback and close observation of student progress. Best of all, none of the students stated to have suffered from chronic stress or demonstrated persistent passivity or complete apathy (learned helplessness as described by Howard (2000) and Jensen (1998)).

On the other hand, two students found sample analyses boring, while another student did not like the time of the lesson. Besides, one student did not like review sessions as he did not feel competent enough. However, he confessed that the checklists/rubrics made him feel more comfortable. One more student stated to have disliked formal writing, but she admitted that it was something compulsory and she had to learn it anyway.

Furthermore, all of the students found writing meaningful and relevant to themselves. They stated to have acquired various skills during the course such as writing skills, computer skills, teaching skills, emotional intelligence, and an awareness of needs. They found all of them useful and meaningful for their lives in general, as students, and as teachers as part of their future profession. In fact, even this kind of an awareness indicates that they developed critical observational and evaluation skills because –to be able to present such ideas- they must have mastered the necessary reflection and metacognition skills. Such high-level cortical

functioning also demonstrates that the students must have felt relaxed and fully in control and thus could think logically, organize thoughts, process data and meaningfully learn by achieving a truly alert and emotionally enhanced state as described by Ausubel (as cited in Brown, 1994), Caine and Caine (1991), Goleman (1995) and Howard (2000).

Particularly, the students underlined the importance of the emotions and learning about and applying emotional intelligence. This indicates that it was beneficial to teach and model emotional intelligence as defined and explained by the scheme of Salovey and Goleman (1995, as cited in Howard, 2000). It should also be noted that the students showed indications of their application of what they learned about emotions and the emotional brain in their daily lives and stated to have benefited from them.

In addition, the students made references to the composition course they had been exposed to as part of this study while describing the essential elements of an ideal writing course. This shows that they were extremely impressed by the features and design of this course in which they could gradually master very complicated tasks and felt happy and motivated all the time. This finding is also in favor of what Damasio suggests when he says emotion is always in the loop of reason (1994, as cited in Restak, 2000). In relation to this, for the question which investigated the changes they would make if they were given such a chance, the majority of the interviewees did not propose any changes, while the only suggestion was to increase the weekly number of hours of the course from 3 to 6 and spread the lessons across the week.

Finally, the findings of the current study proved to support the significant results gained by Jensen's study (CASCD, 1997) and Gardner's study (Project Zero). Similar to these two studies in which brain-based methodologies were implemented, this study revealed that students became very autonomous and confident, and they demonstrated highly positive emotional reactions towards the brain-based practices in the English composition course subsequently.

Furthermore, this study indicated the students could develop patterns, make meaning out of the information they explored, and acquire the skills which they were expected to attain upon the completion of this course since the conditions which enable the proper functioning of the brain and body existed. Particularly, by the incorporation of real-world context with its many associations and hands-on experiences, students could achieve whole-brain functioning since the gnostic area in the brain –which is the integrative thinking area located among the somesthetic, auditory and visual association areas and receiving information from all lobes (Hannaford, 1995)- could be activated.

5.3 Implications for Current Practice

The findings of this present study might offer some practical implications for the use of classroom teachers who are highly motivated to welcome challenge and novelty in their classrooms. These implications are presented under the headings the physical setting, teacher-student roles and interaction, curriculum and instruction, and assessment techniques and procedures respectively.

Physical Setting

1. responsive environment with resources, samples, experts, and peers ;
2. comfortable environment with fresh air, pleasant smells, and working space;
3. background music (preferably Baroque or classical) considering the tastes and preferences of the students and the teacher;
4. and multi-sensory information arousing curiosity, creativity, and excitement in the students and the teacher.

Teacher-Student Roles and Interaction

1. promotion of positive and productive emotions;
2. active and purposeful interaction among students;
3. reflection and metacognition activities;
4. guiding and observing student learning and progress;
5. empowering language and behavior;
6. encouraging responsibility and a positive self-image in students;
7. exercising stress management techniques;
8. and welcoming all individual differences.

Curriculum and Instruction

1. selection of interesting and relevant contents and themes;
2. activities which require students to explore, discover, expand themselves and their ways of thinking;
3. teaching and modeling emotional intelligence;
4. teaching Maslow's hierarchy of needs to develop such an awareness in students;

5. use of students' background knowledge;
6. creative construction of meaning through research and exploration;
7. revision of previously learned materials in relation to the recent ones;
8. incorporation of attention gathering tools (surprise, humor, contrast, and novelty)
9. employment of multiple intelligences;
10. activities that have real-life extensions;
11. reflection on students' own concerns, values, and perceptions in comparison with those of others;
12. inviting sharing and empathy;
13. and promoting observation and evaluation skills.

Assessment Techniques and Procedures

1. use of rubrics to show the required level of mastery;
2. process-oriented and multi-modal assessment (rubrics, observation, term projects, journals, self-evaluation, portfolio, and checklists);
3. demonstration of student progress over time through detailed and immediate feedback.

By incorporating these practical implications in their teaching and instruction, teachers can provide learning environments and experiences that are conducive to efficient and long-lasting learning.

5.4 Assessment of the Study

This present study can be improved in several ways. First of all, a longitudinal study carried out with a greater number of students might provide more reliable results. This study lasted ten weeks; however, if there had been more time the subjects would have experienced much more concrete changes in themselves in all aspects. This is because true behavioral changes take time and the students need that process time to digest and fully acquire what they have experienced. Besides, this study included only 23 students at the Department of Foreign Langauge Education of METU, the generalization of the results for all (Turkish) students is limited.

Secondly, the fact that the researcher was also the instructor of the course might have affected the results of the study to some extent. The reseacher herself administered the attitude questionnaire and conducted the interviews, which might have influenced the students' responses. Therefore, different results might have been obtained if the questionnaire had been administered and interviews were conducted by an outsider.

Moreover, in this study, the subjects were prospective teachers; therefore, they viewed all the features of the course as implications for their profession in the future. As a result, this might be a factor which led them to be intrinsically motivated and receptive. Thus, it might be interesting to experiment the brain-based applications with different groups of students.

Finally, to deeply analyze the attitudes of students about such new implementations to instruction and the factors affecting their attitudes, more-

frequently-data-collecting procedures may be employed such as think-aloud protocols or weekly reflection journals. These methods of data collection can closely monitor the difficulties that the students encounter and their expectations as well as other factors concerned with experiencing implementations. They also help the researcher diagnose where the problems arise.

5.5 Implications for Further Research

Further studies on the implementation of brain-based applications might look for the impact of such applications on student achievement. This is because although the current study did not have such an aim, during the process significant changes in student achievement and performance were observed; and thus, this aspect also needs to be investigated.

Similarly, this study was conducted with first year FLE Department students who are young adults and who have reached a certain level of language proficiency. A study conducted with subjects who are at a lower level of English and who are older or younger might provide different results in terms of both students' attitudes towards brain-based applications and their subsequent achievement.

In addition, because a new language teaching model was designed and implemented for teaching writing skills in the present study, further studies might implement this model for teaching other language skills, or other content courses after some modifications in its features about language.

Moreover, the number of studies conducted şn the field of brain-based language learning is very limited in Turkey and in the world; therefore, there is a need for further research.

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APPENDICES

APPENDIX A

FLE 124 ENGLISH COMPOSITION SKILLS II

COURSE OUTLINE

Semester	**2002-2003 SPRING**
Course Code and Title	**FLE 124 Δ ENGLISH COMPOSITION SKILLS II**
Instructor	**Res. Assist. HATİCE BAYINDIR**
Office Hour	**Tuesdays & Thursdays, 9:30 – 11:30**

Catalogue Description
FLE 124 English Composition Skills II course aims to enable students to develop skills in textual analysis and written expression. For this purpose, students will be provided with skills that facilitate understanding of the text and discourse and that emphasize expository and analytical writing.

Course Objectives and Goals
Students will be able to: 1. analyse texts accurately and efficiently with an emphasis on the formation of meaning at the suprasentential/discourse level (backgrounding/foregrounding, cohesion, register, genre, and the concepts of given/new information) ; 2. improve their critical thinking and evaluation skills through reading and writing; 3. develop appropriate essay writing skills (including the writing of essays such as comparison-and-contrast, classification, cause-and-effect, and argumentative); 4. use the internet efficiently to do research on various writing projects which aim to integrate reading and writing skills; 5. appreciate the writing process as an act of understanding their internal and external worlds; 6. develop sensitivity towards world issues and problems;

7. identify/empathize with different roles;

8. appreciate interpersonal processes and activities.

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Course Procedures

1. In-Class Writings and Reviews (40 %):

In each in-class writing session, you are going to write an essay of the assigned type (comparison-and-contrast, classification, cause-and-effect, or argumentative). For the writing of the essay, you are going to be given the first two sessions of the three-hour lesson. In the remaining one session, you are going to be paired by the teacher in order that everybody can review his/her partner's essay based on the given checklist (This checklist is going to be provided by the teacher). Every piece of writing and review will go into the portfolio in the end.

2. Human Development Term Project (15 %):

You will write an argumentative essay using the information you will collect as part of the requirements of your Human Development Festival Project in FLE 126 Reading Skills II course.

According to this project, UNDP (United Nations Development Program) is hosting a world peace & development festival through which they will hire a new generation of expert practitioners who want to contribute with creative solutions to world peace & development by offering strategic approaches to long-standing problems. They seek individuals who can communicate and advance new ideas across cultures and all strata of society. You are invited to represent Turkey in this international world peace & development project festival.

You will choose a topic from the *topics* provided below. The topics below represent major problems (areas in need of development) that the world faces today. You are required to carry out a comprehensive library/internet search to learn every detail about the problem indicated by your topic to write a human development project that suggests creative and unique solutions to the world problem(s).

Your finalized references list needs to include a more-or-less equal distribution of items in view of resource type:(1) online resources: internet sites, (2) library resources: book

chapter, magazine/journal article.

Some web resources:

United Nations Official website: www.un.org

United Nations Development Programme: www.undp.org

Millennium development goals: www.undp.org/mdg/

TOPICS

1. **HUMAN CAPACITY DEVELOPMENT**
   - A. Democratic governance
   - B. Poverty reduction
   - C. Crisis prevention and recovery
   - D. Information and communications technology
   - E. AIDS/HIV
   - F. Warfare
   - G. Violence

2. **EDUCATION**
   - A. Accelerating learning
   - B. Gender equality
   - C. Literacy
   - D. Boosting empowerment
   - E. Promoting learning
   - F. Problem solving skills
   - G. Setting and achieving goals

3. **HUMAN RIGHTS**
   - A. Integrating cultures
   - B. Cultural appreciation
   - C. Enhancing self-reliance
   - D. Self-development
   - E. Skills development
   - F. Women's/children's rights
   - G. Animal rights

4. **SCIENCE**
   - A. Research and discoveries regarding the brain (i.e. education)
   - B. Preventive medicine and health consciousness
   - C. Smoke cessation
   - D. Alcohol and drug prevention
   - E. Alternative medicine/Methods for healing
   - F. Space projects
   - G. Human genome

5. **ENVIRONMENTAL ISSUES**
   - A. Energy and environment
   - B. Animal/Plant Extinction
   - C. Pollution
   - D. Ozone

E. The Greenhouse Effect
F. Nuclear experiments and atomic bombs

On May 14, you need to answer/do the following and hand it in for feedback (5 %):

1. Choose a topic. What problem does this topic indicate?
2. Explain why you have chosen this topic.
3. Prepare a detailed outline of your essay.
4. Write 4 references you may consider to use in your final report. Under the reference entry briefly explain (in 2-3 sentences) what each is about. Equal distribution of resource types (i.e. internet, book, magazine, journal) is required for the references section. See www.apa.org for reference writing conventions.

Your project (due May 30) should include (10 %):

1. Your mission statement
2. Full presentation and analysis of the problem
3. Literature review with references cited (You have to start off by reading the reports on the UNDP official website)
4. Your creative proposal/solution to this major world problem
5. Your rationale for the proposal
6. Discussion of how and why it is a proposal of creative ideas and solution to the problem.
7. Evaluate the strengths and weaknesses of your solution
8. Discuss if your rivals may refute/reject your solution. Discuss their weaknesses and strengths.
9. Your references list (based on all the readings you have done for your project).

In the process of preparing the term project, you are expected to meet the instructor in order to get continous feedback about your work during the instructor's office hours throughout the term. In addition, you will be given the guidelines for writing the argumentative essay.

3. Journal Writing on "News and Articles":

The journal is sort of a record for the reading you do. Remember the journal entries are NOT edited for grammar "stuff." They are only read for content--that you have read something and have written about it and shown some thought about the topic/article.

Its purposes are to 1) get you to read; 2) learn how to summarize and/or paraphrase; 3) get you writing (and therefore thinking) about what you read.

Requirements (You will be provided with a sample journal):

1. Each entry should be about a page and a half, minimum.
2. Include all bibliographic information about reading--titles, authors, dates, etc.
3. No more than two (2) entries from one source--for example, only two chapters from one book (multiple articles from one magazine or newspaper are fine).
4. Must make direct reference to material in source, but journal is not just a retelling of article. The journal needs to include your insight, your reactions, etc.
5. 10 total journal entries for the semester (5 of the entries must be on news/articles written in Turkish).

4. Interview Report:

Depending on the topic you have selected for your Human Development Term Project, you are expected to interview a person –a government officer or the member of a social organization- to collect information about your topic. You need to hand in the questions you will ask in the interview for feedback on May 21. After the interview, you are expected to write an interview report which summarizes the major ideas the person pointed out (due May 28).

Evaluation and Grading	Percentage %
In-Class Writings & Reviews	**40**
Final	**10**
Project	**15**
Assignments	**20**
Self-Evaluation	**5**
Portfolio	**10**

APPENDIX B

LESSON PLAN I

(see Appendix K for the extended version of this lesson plan)

Theme: *The Process of Adolescence*

Overall Outline of the Lesson: *Introduction to the essay*
Thesis Statement
Topic Sentences
Outline Preparation

Physical Environment: *The room is aired by the teacher before the lesson starts; fresh air sprays are used to welcome the Ss with pleasant smells; there is Baroque music(Vivaldi) being played in the background as the Ss enter the room; there is the atmosphere of a playground, Ss chatting with each other and with the T in joy and comfort; seats are organized in a circle so that Ss can see one another clearly and talk to each other in face during the activities. During group activities, music is always on in the background to keep Ss in an alert and relaxed state.*

Duration of the Lesson: *180 minutes (90+90)*

Performance Objectives:

Students completing this lesson will:

1. state the stages of paragraph development which they studied in the previous term: topic sentence, mode of development (examples, explanations, references, etc.), and conclusion,
2. become familiar with the concepts related with essays in general: thesis statement, introduction, various developmental paragraphs, multiple topic sentences, and conclusion,
3. recognize the thesis statement in a written work,
4. identify the topic sentences that support the thesis statement of the whole written work,
5. discuss the overall framework of a written work to get a clear picture of the interrelationships within a text (discourse elements)
6. demonstrate the relationship between the thesis statement and its topic sentences (requiring the employment of multiple intelligences such as verbally explaining, drawing, or acting),
7. become familiar with the process of adolescence in order to get a better understanding of their own development (cognitive, emotional, biological, and social),
8. appreciate the writing process as an act of understanding their internal and external worlds.

Procedures:

Warm-Up (10 mins.):

- Every week, in the first 5-10 minutes of the lessons, everyone tells something he experienced that week which can be considered as something significant to be shared. T generally expects funny or odd anecdotes to make a positive/good start; if not so, T tries to take the issues to that direction so that Ss also get into such mood.
- T initiates a short discussion on the concept of "adolescence" and elicits Ss' relevant experiences.

Pre-Reading (5 mins.):

- Before coming to class that day, Ss have roughly read the research paper entitled *Martha Quest- A universal experience of adolescence* by Meral Çileli (see Appendix L for this research paper).
- T and Ss start to analyze the text with a discussion about the title of the paper.

While-Reading (25 mins.):

- Ss analyze the organization of the research paper with specific references to the thesis statement, topic sentences, introduction, modes of develoment, and conclusion. This analysis is done in the fashion of socratic questioning with the guidance of the teacher.

Post-Reading (140 mins.):

- Having discussed all the organizational elements of the research paper, Ss produce the outline of the paper (This outline can be presented in the form of keywords, mental maps, or can be acted out depending on Ss' preferences) (5 mins.).
- Everyone shares his/her personal experiences related with the period of adolescence in a free discussion format (5 mins.).
- In the computer laboratory, Ss do research about this period and find information about the definiton of adolescence, its stages and relevant stories, examples, etc. (30 mins.).
- T also provides some more handouts including information about the adolescence period (see Appendix M for this handout).

BREAK (10 mins.)

- Ss are put into groups of six to write a group essay about the period of adolescence. Each member in each group will write one paragraph of his group's essay. They organize all the information they have gathered and prepare their outlines for the essays (15 mins.).
- Ss write the essays with the accompanying Baroque music in the background (60 mins.). One sample group essay is provided in Appendix N.
- Upon the completion of the essays, there will be a celebration with simple food and drinks (15 mins.).

APPENDIX C

LESSON PLAN II

Theme: *Personality Features*

Overall Outline of the Lesson: *Introduction and Discussion of the comparison and contrast essay*

Thesis Statement and Topic Sentences

Outline Preparation/ Multiple Patterns

Physical Environment: *The room is aired by the teacher before the lesson starts; fresh air sprays are used to welcome the Ss with pleasant smells; there is Baroque music (Vivaldi) being played in the background as the Ss enter the room; there is the atmosphere of a playground, Ss chatting with each other and with the T in joy and comfort; seats are organized in a circle so that Ss can see one another clearly and talk to each other in face during the activities. During group activities, music is always on in the background to keep Ss in an alert and relaxed state.*

Duration of the Lesson: *180 minutes (90+90)*

Performance Objectives:

Students completing this lesson will:

1. define the concepts of "comparison" and "contrast",
2. explain why people compare and/or contrast,
3. identify the similarities and differences between objects, people, etc.,
4. give examples of comparison and contrast from daily life/ real life,
5. know the features of the thesis statement of a comparison and contrast essay,
6. know the organization of a comparison and contrast essay,
7. analyze the features of a compar,ison and contrast essay on sample essays,
8. prepare visual representations of personality features.

Procedures:

Warm-Up (10 mins.):

- Every week, in the first 5-10 minutes of the lessons, everyone tells something he experienced that week which can be considered as something significant to be shared. T generally expects funny or odd anecdotes to make a positive/good start; if not so, T tries to take the issues to that direction so that Ss also get into such mood.

- T initiates a short discussion on why people compare and/or contrast in real life/ daily life. Ss discuss the possible reasons and try to give examples from daily life.

Pre-Writing/1 "Brainstorming on a topic" (30 mins.):

- T introduces the topic of Bush and Saddam because they are currently popular people and most of the Ss can have something to say about them. Ss discuss these two leaders' features, such as their backgrounds, philosophies, or attitudes towards war and try to come up with a thesis statement for a possible comparison/contrast essay.

Sample Result:

Thesis Statement:"Bush and Saddam are equally uncooperative leaders."

Possible Organizational Patterns: Point by Point

1. Background (Bush and Saddam)
2. Philosophy (Bush and Saddam)

All of One – All of the Other

1. Bush (Background and Philosophy)
2. Saddam (Background and Philosophy)

By this activity, the Ss have the chance to prepare a rough outline for a comparison and contrast essay (as a whole class). Then, to present some linguistic elements for the expression of comparison and contrast, the next pre-writing session is conducted.

Pre-Writing/2 "Linguistic Input" (25 mins.):

- T reads a comparison and contrast essay about two extremely different people (Type A and Type Z persons). Ss listen to what T reads, identify the personality features of each type and fill in the below chart on the board as a whole class.

	TYPE A	**TYPE Z**
FEATURES (WORDS)		
FEATURES (PICTURES)		

-In their second listening, Ss also pay attention to the use of certain expressions including transitions like unlike, similar to, different from, similarly, whereas, and comparative and superlative forms, etc.; that is, pick out the language used for comparing and contrasting.

Pre-Writing/3 "Linguistic and Organizational Input" (30 mins.):

- Ss are put into groups to analyze sample comparison and contrast essays, and identify the features of such essays, such as the kind of transitions, thesis statements, topics sentences, organizational patterns, points of comparison/contrast, etc.
- Groups select their representatives to present the features of the essays they have identified in front of the class.

BREAK (10 mins.)

While-Writing (80 mins.):

-Ss make use of the outline for the essay on Bush and Saddam that was prepared in the class and write their first comparison/contrast essay. Their writing is accompanied by the Baroque music in the background. They are free to move, talk to each other and to the T, and consult anyone or any resource they like.

APPENDIX D

LESSON PLAN III

Theme: *Are you for or against the war?*

Overall Outline of the Lesson: *Introduction and Discussion of the argumentative essay*
Thesis Statement and Topic Sentences
Proponent and Counter Arguments
Justification and Refutation
Outline Preparation/ Multiple Patterns

Physical Environment: *The room is aired by the teacher before the lesson starts; fresh air sprays are used to welcome the Ss with pleasant smells; there is Baroque music (Vivaldi) being played in the background as the Ss enter the room; there is the atmosphere of a playground, Ss chatting with each other and with the T in joy and comfort; seats are organized in a circle so that Ss can see one another clearly and talk to each other in face during the activities. During group activities, music is always on in the background to keep Ss in an alert and relaxed state.*

Duration of the Lesson: *180 minutes (90+90)*

Performance Objectives:

Students completing this lesson will:

1. define the concepts of "argumentation",
2. explain why people argue,
3. give examples of argumentation from real-life experiences,
4. know how to write an argumentative thesis statement,
5. know how to identify possible proponent and counter views,
6. know the organizational features of an argumentative essay,
7. analyze the features of argumentation on sample essays,
8. work in collaboration with the peers,
9. work out solutions for hypothetical problems,
10. identify/empathize with different roles.

Procedures:

Warm-Up (15 mins.):

- Every week, in the first 5-10 minutes of the lessons, everyone tells something he experienced that week which can be considered as something significant to be shared. T generally expects funny or

odd anecdotes to make a positive/good start; if not so, T tries to take the issues to that direction so that Ss also get into such mood.

- T initiates a short discussion on why people argue in real life/ daily life. Ss discuss the possible reasons and try to give examples from daily life.

Pre-Speaking (35 mins.):

- T attracts Ss attention to a video-clip presenting excerpts from the press conferences of Bush and Saddam. These excerpts provide information about their personal views and reflections about the Iraq-USA war and help Ss to get prepared for the roles in the upcoming roleplay activity.

- After Ss watch the video-clip, they are put into groups of 4, and each group is given a role-card like the sample below.

The Daily Post is a premier international newspaper for opinion leaders and decision makers around the world. In an era of information overload, those who both make and track decisions on the global level depend upon the DP as the most complete, credible and concise daily newspaper in the world. The DP draws on the most powerful and discerning international newsgathering network of any newspaper in the world. Its experienced editors decipher critical early warning signals from sources around the world to give readers a balanced, practical assessment of emerging trends.

June

You are a novice investigative newspaper reporter working for the Daily Post. Although you are quite inexperienced in your profession, you are very enthusiastic and dedicated, and you want to explore your potential through challenging tasks. Being aware of your intellectual capacity and seriousness of purpose, the editor of the newspaper wants you to work in collaboration with a more experienced colleague of yours -named Isaac- and prepare the first part of a three-episode news story. The whole story will be about the USA and Iraq war, and you will analyse, argue and evaluate all aspects of the issue including America's and Iraq's intentions, positions, and activities, and reactions from all over the world. Never forget that in your argumentation, your frame of reference is love and peace for everyone, and developing arguments that will address the needs of all parties involved in the issue (all world citizens). Now, it is evening time, and you are sitting together with Isaac in the office. You, two, have to come up with an outline reflecting the whole picture within a couple of days. For the time being, just discuss and try to list all arguments that appeared in favor of/against the USA-Iraq war.

- Ss ,elaborating on the relevant information they have gathered, spend 10-15 minutes to get prepared for the roleplay. While preparing, they go over the roleplay checklist provided at the end of this lesson plan to perform properly in the roleplay.

While-Speaking (30 mins.):

-Ss perform the roleplay.

Post-Speaking (10 mins.):

-Ss talk about and analyze the arguments they proposed and the kind of argumentation strategies that took place during the play.

BREAK (10 mins)

Pre-Writing (40 mins.):

-Ss ,in groups, work on sample argumentative essays to identify their features. They pay attention to the kind of transitions, thesis statements, topics sentences, organizational patterns, argumentation strategies, pro and con development, justification and refutation modes, etc.

-Based on this analysis, T and Ss together construct the argumentative essay guidelines. The guidelines should possess the following features roughly:

For the paper to be "Advanced" (excellent and sophisticated work quality):

1. Introduction develops a significant and compelling position.
2. Support uses appropriate multiple modes (for ex, compare/contrast; cause/effect).
3. Each aspect of argument relates to thesis, providing coherence and continuity.
4. Potential objections to argument (refutation) are raised and answered by writer.
5. Resource material is acknowledged and integrated logically.
6. Conclusion is compelling/encourages action/makes suggestions or predictions.

For the paper to be "Proficient" (accomplished level of work):

1. Introduction develops a clearly stated position.
2. Modes used for support are not necessarily appropriate.
3. Each aspect of argument is there, but the writer may not have shown connection to thesis.
4. Refutation lacks sincerity and may not answer objections to the argument.
5. Resource material is acknowledged but may not be logically integrated into the text.
6. Conclusion lacks compelling elements of an "Advanced" paper.

For the paper to be "Basic" (quality of work shows developing skill):

1. Introduction is evident, but position is not clearly stated.
2. Support for argument is rational, but relies on a single mode.
3. Some aspects of argument do not relate to thesis.
4. Refutation is evident but incomplete.
5. Material from outside sources is evident but not necessarily acknowledged.
6. Conclusion ends abruptly or simply restates position.

For the paper to be "Novice" (beginning-level work quality):

1. Introduction is vague or fails to establish a position that responds to the topic.
2. Body is too brief to develop a convincing argument.
3. Essay lacks focus and tends to wander.
4. Refutation of opposing views is absent.
5. Outside sources are not acknowledged and/or used.
6. Conclusion is missing or incomplete.

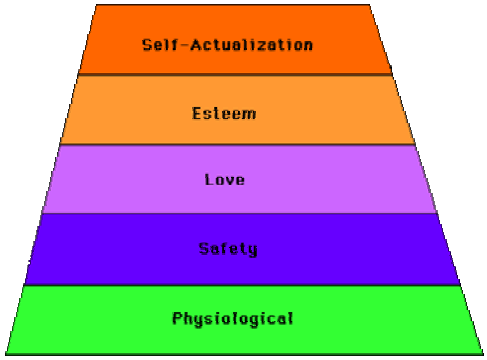
While-Writing (50 mins.):

- Ss start writing their first argumentative essays. The topic is the Iraq-USA war, and Ss prepare their outlines individually before writing their essays. They can interact with each other while doing this task, and T monitors them and provides help whenever needed. Ss are given the chance to complete their essays outside the class since they will certainly need extra time.

APPENDIX E

MASLOW'S HIERARCHY OF NEEDS

(Adapted from: http://www.simplynumbers.com/articles/maslow2.htm)



Maslow's famous "Hierarchy of Needs" was introduced in the late 1960's. His hierarchic theory of needs is often represented as a pyramid, with the larger, lower levels representing the lower needs, and the upper point representing the need for self-actualization. Maslow believes that the only reason that people would not move well in direction of self-actualization is because of hindrances placed in their way by society. Maslow states that people should respond to the potential an individual has for growing into a self-actualizing person of his/her own kind.

According to Maslow, there are general types of needs (physiological, safety, love, and esteem) that must be satisfied before a person can act unselfishly. He called these needs "deficiency needs." As long as we are motivated to satisfy these cravings, we are moving towards growth, toward self-actualization. Satisfying needs is healthy, blocking gratification makes us sick or evil. In other words, we are all "needs junkies" with cravings that must be satisfied and should be satisfied. Else, we become sick.

According to Maslow, when the deficiency needs are met, at once other (and higher) needs emerge, and these, rather than physiological hungers, dominate the organism. And when these in turn

are satisfied, again new (and still higher) needs emerge, and so on. As one desire is satisfied, another pops up to take its place.

Maslow is a humanistic psychologist. Humanists focus upon potentials. They believe that humans strive for an upper level of capabilities. Humans seek the frontiers of creativity, the highest reaches of consciousness and wisdom. This has been labeled "fully functioning person", "healthy personality", or as Maslow calls this level, "self-actualizing person."

Maslow has set up a hierarchy of five levels of basic needs. Beyond these needs, higher levels of needs exist. These include needs for understanding, esthetic appreciation and purely spiritual needs. In the levels of the five basic needs, the person does not feel the second need until the demands of the first have been satisfied, nor the third until the second has been satisfied, and so on. Maslow's basic needs are as follows:

Physiological Needs

Physiological needs are the very basic needs such as air, water, food, sleep, and a relatively constant body temperature. When these are not satisfied we may feel sickness, irritation, pain, discomfort, etc. These feelings motivate us to alleviate them as soon as possible to establish homeostasis. Once they are alleviated, we may think about other things. They are the strongest needs because if a person were deprived of all needs, the physiological ones would come first in the person's search for satisfaction.

Safety Needs

When all physiological needs are satisfied and are no longer controlling thoughts and behaviors, the needs for security can become active. Safety needs have to do with establishing stability and consistency in a chaotic world. These needs are mostly psychological in nature. We need the security of a home and family. Many people cry out for law and order because they do not feel safe enough to go for a walk in their neighborhood. Many people, particularly those in the inner cities, unfortunately, are stuck at this level. In addition, safety needs sometimes motivate people to be religious. Religions comfort us with the promise of a safe secure place after we die and leave the insecurity of this world. Adults have little awareness of their security needs except in times of emergency or periods of disorganization in the social structure (such as widespread rioting). Children often display the signs of insecurity and the need to be safe.

Needs of Love, Affection and Belongingness

When the needs for safety and for physiological well-being are satisfied, the next class of needs for love, affection and belongingness can emerge. Maslow states that people seek to overcome

feelings of loneliness and alienation. This involves both giving and receiving love, affection and the sense of belonging. Humans have a desire to belong to groups: clubs, work groups, religious groups, family, gangs, etc. We need to feel loved by others, to be accepted by others. Performers appreciate applause. We need to be needed.

Esteem Needs

When the first three classes of needs are satisfied, the needs for esteem can become dominant. These involve needs for both self-esteem and for the esteem a person gets from others. Therefore, there are actually two types of esteem needs. First is self-esteem which results from competence or mastery of a task. Second, there's the attention and recognition that comes from others. This is similar to the belongingness level, however, wanting admiration has to do with the need for power. Humans have a need for a stable, firmly based, high level of self-respect, and respect from others. When these needs are satisfied, the person feels self-confident and valuable as a person in the world. When these needs are frustrated, the person feels inferior, weak, helpless and worthless.

Self-Actualization

When all of the foregoing needs are satisfied, then and only then are the needs for self-actualization activated. Maslow describes self-actualization as a person's need to be and do that which the person was "born to do." "A musician must make music, an artist must paint, and a poet must write." In other words, the need for self-actualization is "the desire to become more and more what one is, to become everything that one is capable of becoming." People who have everything can maximize their potential. They can seek knowledge, peace, esthetic experiences, self-fulfillment, oneness with God, etc.

Self-actualizing means that people are "fully functional" and possessing a "healthy personality". It also means the people on this level think and act purely on their own volition. Thus, self-actualizing implies free will.

These needs make themselves felt in signs of restlessness. The person feels on edge, tense, lacking something, in short, restless. If a person is hungry, unsafe, not loved or accepted, or lacking self-esteem, it is very easy to know what the person is restless about. It is not always clear what a person wants when there is a need for self-actualization.

Maslow proposes that when one is at his best (satisfied in terms of all these needs), he possesses values including truth, goodness, beauty, unity, transcendence, aliveness, uniqueness, perfection, justice, order and simplicity. This person is very fine, healthy, strong, sagacious (very smart) and creative.

As a result, here are some implications of this awareness concerning the man's needs:

1. We should teach people to be *authentic,* to be aware of their inner selves and to hear their inner-feeling voices.
2. We should teach people to *transcend their cultural conditioning* and become world citizens.
3. We should help people *discover their vocation in life.* This is especially focused on finding the right career and the right mate.
4. We should teach people that *life is precious,* that there is joy to be experienced in life, and if people are open to seeing the good and joyous in all kinds of situations, it makes life worth living.
5. We must *accept the person* as he or she is and help the person learn their inner nature. From real knowledge of aptitudes and limitations we can know what to build upon, what potentials are really there.
6. We must see that the person's *basic needs are satisfied.* This includes safety, belongingness, and esteem needs.
7. We should *refreshen consciousness,* teaching the person to appreciate beauty and the other good things in nature and in living.
8. We should teach people that *controls are good,* and complete abandon is bad. It takes control to improve the quality of life in all areas.
9. We should teach people to transcend the trifling problems and *grapple with the serious problems in life.* These include the problems of injustice, of pain, suffering, and death.
10. We must teach people to be *good choosers.* They must be given practice in making good choices.

APPENDIX F

COLLEAGUE OBSERVATION REPORT

Dear Hatice,

Personally, I felt very happy to observe such a class in which learning is not a transfer of information but a collaborative construction of meaning, as a result of which students become agents and active seekers of knowledge rather than the passive receivers. The basic aim in this class seems to be the process of acquiring the skills necessary to learn how to learn. The different styles and characteristics of learners are supported so that they become aware that they are unique personalities adding to the rich environment of the class and to the whole world.

Thanks a lot for inviting me to your class.

Best,

Duygu Kükürt

FEEDBACK ON THE APPLICATION OF BRAIN-BASED LEARNING

Physical Setting/Environment

The learning environment in the class I have observed is quite rewarding and stimulating in that there is a supportive and relaxed relationship both between the teacher and students, and among the students. Moreover, the resources, such as dictionaries, books and magazines related to the topic of the lesson, available for the students' use not only provide an inspiring and curiosity feeding setting but also enhance learning by helping students feel safe. The classroom is large enough to form groups of different size, and there are big windows some of which are open, which creates an environment fresh and full of oxygen. Also remarkable to mention is the music played in the background during group activities, which creates tranquility and adds to the peaceful environment.

Teacher-Student Roles and Interaction

The teacher helps students develop positive attitudes towards learning and the subject matter itself. She encourages them to become independent learners who can take the responsibility of their own learning and can reflect on their process. There is a strong presence of the teacher in terms of

providing information and guidance when necessary. There is a lot of encouraging language to praise and motivate learners. Another point attracted my attention during the class is the fact that the teacher maintains consistency by setting the rules and expectations beforehand so that students are aware of their roles and responsibilities. For example, while they are preparing for the role-play activity, the teacher just reminds them to consider the checklist they have had before by eliciting the points mentioned there. Students seem to be having fun working together in collaboration.

Curriculum and Instruction

The content of the lesson is chosen carefully from daily topics (e.g. Iraq war), which arouses interest and lets students explore, discover, and expand themselves as well as questioning their ways of thinking. The teacher encourages students to include their feelings, ideas, and emotions into what they are doing by providing a variety of activities integrated into one lesson (e.g. working in groups to get prepared for the role-play, doing an intensive reading about the situation and their roles, coming onto the stage and acting as well as listening, reflecting on their friends' performance, and conducting a whole-class discussion, and a feedback session on what they have just practiced). Also, the activities and tasks are challenging in terms of content and language so that students can have the sense of satisfaction and success. However, students are not forced to produce anything unless they are ready and the teacher provides the necessary help and praise for them to feel confident.

Assessment Techniques and Procedures

There exists a checklist available for each student in order to assess their own progress. They become aware of their strengths and weaknesses also by reflecting on their friends' work. Obviously, there are multiple sources of evaluation such as portfolio, process writings, classroom activities, and self-evaluation, which focuses on the students' improvement over time rather than assessing their knowledge merely by means of exams and quizzes (They allocate a block after the class time in order to give feedback to each other). I have seen some of the students' essays with detailed feedback focusing not only on the form but also on the content, personal opinions, and creativity, which shows that their work is given importance and considered carefully.

APPENDIX G

“ROSE SEED”

APPENDIX H

EMOTIONAL INTELLIGENCE

(Adapted from: http://www.stresstips.com/ei.htm)

Schools have historically concentrated on boosting students' cognitive abilities. But developing students' emotional smarts is just as vital.

Emotions are important due to the physiology of the brain and the relationship between the emotional brain and the brain's executive areas. The prefrontal lobes -just behind the forehead- are where working memory resides. Working memory is what you are paying attention to at any given point. So everything you are mulling over, making a decision about, or are learning, is at first in working memory. All learning is in working memory. And the emotional centers that control moods like anxiety or anger have very strong connections to the prefrontal areas.

So if a child is chronically anxious or angry or upset in some way, he experiences that as intruding thoughts. He can't keep his mind off the thing he is worried about. Now working memory has a limited attention capacity. So, to the extent that it is occupied by these intrusive thoughts, it shrinks what's available in working memory to think about what you are trying to learn.

The good news about emotional intelligence is that it is virtually all learned. Even though newborn children differ in terms of their temperament, for example, they are highly open to changes.

The best data on this come from Jerome Kagan, who studied shy kids. He found that you can identify a tendency toward shyness within the first two weeks of life, by looking at how much an infant startles to a noise or whether they are likely to shy away from stimulating, new, novel, uncertain experiences. He followed kids from birth into childhood and teenage years and found that this is a remarkable predictor of shyness.

But he also discovered that a sub-group of children whose newborn behaviors suggested they would be shy turned out not to be. Kagan found that the parents of this group treated them differently. Instead of catering to the children's shyness and protecting them from the world, these parents pushed them a bit into challenging situations; you know, meet a new kid, let's go to this new place. Not in a way that overwhelmed them but in a way that gave them the continued experience of

mastering something new. And by the time they got to kindergarten, those kids weren't shy. They weren't the most extroverted, but they weren't inordinately shy either.

Well, they suggest something that, in theory, we've known all along: the brain is enormously malleable during childhood. The brain's regulatory centers for emotional response are among the last parts to become anatomically mature. They continue to grow into adolescence. This is vitally important, because we're finding that the repeated emotional lessons of a child's life literally shape the brain circuits for that response. So if a child learns to manage his anger well, or learns to calm or soothe himself, or to be empathic, that's a lifelong strength. That's why it's so critical that we help children develop the skills of emotional intelligence.

The sooner we begin to teach children appropriate emotional responses, the sooner these responses can become a part of their repertoire. A child may have learned that when you get mad, you yell and you hit. Someone has to help these children learn an alternative response that becomes stronger than the initial one. So instead of yelling and hitting, the child will stop, calm down, think before she acts, and so on.

Again, the good news about childhood is that it's a wonderful palette to work with. It may look like it's been painted on, but you can keep painting and eventually children can learn healthier emotional responses. The literature on resilient children, those who have grown up in the worst circumstances and yet thrived, shows that what made the difference wasn't the terrible circumstance of their chaotic home life, but the fact that one caring adult really got involved in their lives and helped them out. And oftentimes that person is a teacher.

For instance, in the New Haven schools, the program addresses all the skills I mentioned before, like empathy, how to calm yourself down when you are feeling anxious, and so on. In some grades, lessons in emotional intelligence are taught as a separate topic three times a week. In other grades it's part of courses such as health, even math or study skills. And all the teachers are familiar with the ideas and look for opportunities to teach them. So whenever a child is upset, it's an opportunity to make sure that they learn something from that experience that will help them.

In New Haven, they also use techniques that make healthy emotional responses a pervasive part of the school culture or environment. For example, a school I recently visited had a "stoplight" poster on the wall of every room. It indicates to kids that whenever you are distressed or upset or you have a problem, red light--stop, calm down, and think before you act. Yellow light--think about a number of different things you could do and what the consequences will be. Green light--pick the best one and try it out. Now that's a wonderful lesson in impulse control, in soothing yourself, and in making the distinction between having the feeling and what you do, how you act when you have the feeling. These are crucial lessons and kids are really learning them. That's revolutionary, and what's happening is that children are expanding their emotional repertoire in some healthy ways. They've

found that students are better able to control their impulses, they've improved their behavior, they have better conflict-resolution skills and skills in handling interpersonal problems.

I believe that schools must teach children how to recognize and manage their emotions, and that educators must model emotional intelligence in caring, respectful interactions with children. "Emotional circuits are sculpted by experience through childhood, and we leave those experiences utterly to chance at our peril."

Defining Emotional Intelligence

Emotional intelligence is a different way of being smart. It includes knowing what your feelings are and using your feelings to make good decisions in life.

1. It's being able to manage distressing moods well and control impulses.
2. It's being motivated and remaining hopeful and optimistic when you have setbacks in working toward goals.
3. It's empathy; knowing what the people around you are feeling.
4. It's social skill--getting along well with other people, managing emotions in relationships, being able to persuade or lead others.

More about emotional intelligence….

Emotional intelligence is a type of social intelligence that involves the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and actions. This involves abilities that may be categorized into five domains:

1. **Knowing one's emotions:** Self-awareness –recognizing a feeling as it happens- is the keystone of emotional intelligence. The ability to monitor feelings from moment to moment is crucial to psychological insight and self-understanding. People with greater certainty about their feelings are better pilots of their lives, having a surer sense of how they really feel about personal decisions from whom to marry to what job to take.
2. **Managing emotions:** Handling feelings so they are appropriate is an ability that builds on self-awareness. This involves realizing what is behind a feeling, and finding ways to handle fears and anxieties, anger, and sadness. People who are poor in this ability are constantly battling feelings of distress, while those who excel in it can bounce back far more quickly from life's setbacks and upsets.
3. **Motivating oneself:** This involves channeling emotions in the service of a goal, emotional self-control, delaying gratification, and stifling impulses. People who have this skill tend to be more highly productive and effective in whatever they undertake.
4. **Recognizing emotions in others:** Empathy, another ability that builds on emotional self-awareness, is the fundamental "people skill". This involves sensitivity to others' feelings and concerns and taking their perspective, and appreciating the differences in how people feel about things.

5. **Handling relationships:** The art of relationships is, in large part, skill in managing emotions in others. This involves the abilities such as popularity, leadership, and interpersonal effectiveness. People who excel in these skills interact smoothly with others and they are social stars.

APPENDIX I

SURVEY OF STUDENTS' ATTITUDES TOWARDS BRAIN-BASED APPLICATIONS IN THE ENGLISH COMPOSITION SKILLS II COURSE

Fill out the following questionnaire for the English Composition II course, checking the box which best describes your attitude/feeling about each statement related with this course.

There is no right or wrong answer; all that is important is that you indicate your true personal feelings.

Your choices for responses include:
SA=Strongly Agree (if you strongly agree with the idea stated in the item),
A=Agree,
U=Undecided,
D=Disagree,
SD=Strongly Disagree (if you strongly disagree with the idea stated in the item), and
NA=Not Applicable (if the condition stated in the item was not present in the English Composition II course).

I really appreciate the time you have taken to respond to this survey!
Thank you very much for your precious contributions!

	Please indicate your attitude towards the features of "Physical Setting/Environment". ***In the English Composition II course…***	**Strongly Agree**	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**	**Not Applicable**
1	Learning was fun because the environment was responsive (that is, there were open, respectful and cooperative relationships).						
2	I liked seeing materials such as posters and bulletin boards in the classroom which reflected the topic and the language being studied.						
3	I felt both comfortable and receptive because the environment was an inviting and stimulating setting which included all the elements of pleasant smells and sounds, various resources, samples and working space.						
4	I could recall information more readily because the environment provided as much visual, auditory, sensory, and semantic detail as possible.						

5	I felt both relaxed and alert because of the Baroque (e.g., Vivaldi)/classical (e.g., Rachmaninoff) music that was played in the background during some classroom activities (such as group activities, projects, reflection or prewriting activities).						
	Please indicate your attitude towards the features of "Teacher-Student Roles and Interaction": ***In the English Composition II course…***	**Strongly Agree**	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**	**Not Applicable**
1	I liked the teacher's helping me to become aware of and manage my feelings.						
2	I felt relaxed because the teacher employed various strategies to attract our individual interests (such as by roleplays, weekly journals, sample essays, or projects).						
3	I liked consciously reviewing my learning through activities such as journal writing, reflection, and self-evaluation to develop personal connections with the material at hand.						
4	I liked actively participating in the educational process through interactive, creative, cooperative and collaborative learning situations (such as roleplays and term projects).						
5	I felt relaxed because the teacher guided my learning, growth and development through her constructive feedback and her close observation of my progress.						
6	I felt both responsible and motivated because the teacher employed empowering language and behavior towards me (e.g., You can do it).						
7	Learning was fun because there was mutual love, caring and respect between the teacher and us.						
8	I enjoyed the lessons because the teacher provided well-planned lessons.						
9	I felt both comfortable and motivated because the teacher was accepting, nonjudgmental, and non-threatening while interacting with us.						
10	I felt motivated because the teacher encouraged me to set specific and realistic goals and to see the connections between my actions and their outcomes.						
11	I felt relaxed because we exercised stress management techniques such as relationship skills, peer support, and physical movement in the classroom.						

	Please indicate your attitude towards the features of "Curriculum and Instruction": *In the English Composition II course…*	**Strongly Agree**	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**	**Not Applicable**
1	I liked the contents through which I learned the language because they had substance enough to let me explore, discover, and expand myself and my ways of thinking (e.g., term projects, or journal writing).						
2	I enjoyed learning about emotions and the emotional intelligence.						
3	I liked learning about Maslow' s hierarchy of needs to become more aware of our needs.						
4	Learning was fun because the teacher provided opportunities for our expression and engagement of emotions through various classroom activities (such as drama, music, journal writing, collaboration, team/pair work, and novelty and curiosity seeking activities).						
5	I felt confident to participate in all the activities including drama, games, discussions, debates, reflection about personal issues, and celebrations.						
6	I felt both relaxed and fully in control because I was able to set my own goals and make use of my background knowledge.						
7	I enjoyed learning because I was encouraged to construct my own meaning rather than being presented with a linear, planned, piece-by-piece presentation of language and content.						
8	I liked to organize and practice the newly learned material on my own.						
9	I enjoyed learning because the teaching included variations and challenges (after I demonstrated initial comprehension of the new material) in order to make me explore the material's deeply felt meaning.						
10	I liked the teacher's providing me with opportunities for tasks such as assignments, projects, writing scripts, and personal progress reports to review old materials.						
11	I felt alert in the lessons because they were scheduled between 9:00 a.m. and 13:00 p.m.						
12	I felt both alert and receptive because the instruction involved some kind of suddenness (surprise effect), loudness, contrast, novelty, or movement-related and creativity-seeking activities.						
13	I felt focused because the instruction provided a variety of activities which required intuition, insight, creativity, or imagination.						

14	I felt both relaxed and fully in control because I was able to make use of my background knowledge.						
15	I felt motivated because the lessons required the use of metaphors, stories, role-playing, movements, discussions, demonstrations, or drawing.						
16	I felt motivated because I participated in meaningful and challenging lessons that invoked my curiosity and search for meaning.						
17	I enjoyed learning because the instruction involved various strategies to reach all seven intelligences (such as teaching through narration, questioning, drawing concepts, using drama, using voice rhythmically, dynamically interacting with the others, and bringing feeling into presentation).						
18	Learning was fun because the lessons reflected a natural connection to real-life experiences (e.g., term projects, or roleplays).						
19	I felt positively challenged because activities that required the use of computer, internet, authentic magazines, or newspapers took place in the classroom.						
20	I felt both motivated and receptive because the instruction was at or just above my proficiency level.						
21	I felt relaxed because I was not forced to produce anything until I felt and got ready (e.g., the vocabulary assignment).						
22	I felt motivated because me learning was a process of creative construction and it involved trial and error (e.g., students had the opportunity to rewrite their work).						
23	I liked to use the language structures meaningfully and appropriately in the lessons (such as in roleplays, or during writing activities).						
24	I liked the lessons' encouraging me to become sensitive about what language is and how language works (by activities such as sample essay finding, or essay analyses).						
25	I felt motivated because the course content was designed from a theme-based point of view so that interesting themes gave us a basis for understanding and acquiring new language structures and patterns.						
26	I liked the activities such as drama that required using the language as well as the activities such as essay analysis that required talking about the language.						
27	I liked the course materials' giving me time and chance to reflect on my own concerns, perceptions, and values in comparison with those of others, encouraging personal growth, and inviting empathy and sharing between us.						
28	Learning was fun because studying, responding to and producing the course materials all led me to both sharpen my observational and evaluation skills and see the possibilities of new relationships between bits of information.						

	Please indicate your attitude towards the features of "Assessment": *In the English Composition II course…*	**Strongly Agree**	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**	**Not Applicable**
1	I liked the teacher's use of rubrics/checklists to show the required level of performance.						
2	I felt motivated because the teacher emphasized that no student would be left without reaching the required level of mastery.						
3	I felt comfortable because the teacher preferred process-oriented testing techniques such as rubric, checklist, observation, portfolio, and self-evaluation.						
4	I felt both relaxed and motivated because the teacher's assessment considered the multiple ways I processed information and the multiple ways by which I could demonstrate my performance (multiple intelligences).						
5	I liked the teacher's assessment techniques because they provided multiple sources of evaluation and gave an in-depth view of my progress.						
6	I felt confident because the assessment procedures showed my processes and improvement over time, and provided extended product revisions (such as rewrite and review sessions).						
7	I liked the assessment techniques because they encouraged me to reflect on my performance and progress.						
8	I liked the assessment techniques' providing me with specific, immediate, personal, and detailed feedback about my performance.						

APPENDIX J

INTERVIEW QUESTIONS

*The questions below aim to reveal **students' opinions, feelings and values** concerning the English Composition II course.*

1. What are your feelings about the kind of experiences you have gone through in this composition course?
    a. with respect to the features of the physical setting/environment (background music, posters, resources, space, etc.)?

    b. with respect to the features of teacher-student roles and interaction (teacher guidance, empowering language/behavior, peer support, flexibility, cooperation, emotional expression, etc.)?

    c. with respect to the features of curriculum/course content and instruction/teaching-learning (term projects, journals, roleplays, discussions, reflection, drawing, group work, internet research, essay analyses, peer reviews, novelty and challenge, creativity, etc.)?

    d. with respect to the features of the assessment/evaluation techniques and procedures (rewrite and review sessions, portfolio, term projects, self-evaluation, checklists, roleplays, mindmaps, observation, teacher feedback, peer feedback, reflection, etc.)?

2. How did taking this composition course make you feel? Explain.
3. Did you like this composition course?
    a. What specifically did you like?
    b. What specifically did you dislike?
4. Have you found composition writing meaningful and relevant to you? Explain.
5. What are the skills you have acquired in this composition course?
6. Do you believe you will use the skills you have acquired in this course in the future? Explain.
7. What are your opinions about how writing skills should be taught based on your experiences in this composition course?
8. If you were given such a chance, what changes would you make in this course?

APPENDIX K

LESSON PLAN I (Extended Version)

Theme: *The Process of Adolescence*

Overall Outline of the Lesson: *Introduction to the essay*
Thesis Statement
Topic Sentences
Outline Preparation

Physical Environment: *The room is aired by the teacher before the lesson starts; fresh air sprays are used to welcome the Ss with pleasant smells; there is Baroque music(Vivaldi) being played in the background as the Ss enter the room; there is the atmosphere of a playground, Ss chatting with each other and with the T in joy and comfort; seats are organized in a circle so that Ss can see one another clearly and talk to each other in face during the activities. During group activities, music is always on in the background to keep Ss in an alert and relaxed state.*

Duration of the Lesson: *180 minutes (90+90)*

Performance Objectives:

Students completing this lesson will:

9. state the stages of paragraph development which they studied in the previous term: topic sentence, mode of development (examples, explanations, references, etc.), and conclusion,
10. become familiar with the concepts related with essays in general: thesis statement, introduction, various developmental paragraphs, multiple topic sentences, and conclusion,
11. recognize the thesis statement in a written work,
12. identify the topic sentences that support the thesis statement of the whole written work,
13. discuss the overall framework of a written work to get a clear picture of the interrelationships within a text (discourse elements)
14. demonstrate the relationship between the thesis statement and its topic sentences (requiring the employment of multiple intelligences such as verbally explaining, drawing, or acting),
15. become familiar with the process of adolescence in order to get a better understanding of their own development (cognitive, emotional, biological, and social),

16. appreciate the writing process as an act of understanding their internal and external worlds.

Procedures:

Every week, in the first 5-10 minutes of the lessons, everyone tells something s/he experienced that week which can be considered as something significant to be shared. T generally expects funny or odd anecdotes to make a positive/good start; if not so, T tries to take the issues to that direction so that Ss also get into such mood.

Then all of a sudden T turns and asks: Have you ever heard the word adolescence?

Ss (*surprised by the question*): Yes, it covers the period from roughly age 10 to 20 in a child's development.
T: What kind of a period is that? What kind of changes (cognitive, emotional, biological, and social) occur in that period?
Ss: A time of confusion; great changes take place.
T: Do you think you have completed that period? Is there anyone around you, a sibling or cousin, who is experiencing that period at present?
Ss: Yes..(They narrate their relevant experiences.)

T writes down their comments on the board.

T: As you know, today we will read a research paper about this period (*Martha Quest- A Universal Experience of Adolescence* by Meral Çileli in Appendix L). Actually, you have read it previously, now we will discuss it. But before we start, have you ever heard what a research paper is?
Ss might prabobly not know it.

T: In fact, this is the kind of writing you will frequently come across in your future years of training at this Department. You will read and write such papers in your third and fourth year courses mostly. You might also read such papers in your daily life; for instance, you might be interested in some topic and you might find such papers written on your interests. So, as you see from this sample research paper, this is scientific writing, meaning that it is written according to the rules of formal writing; thus, it is not freewriting, you need to present your ideas in an organization by employing the accurate and appropriate language. Your readers should be able to follow what you want to convey step by step by your guidance as a writer.

T: So, you must be very careful while reading this paper, keeping all the things I have just told in your mind: pay attention to its format, language, organization, all the details from the selection of the

title to the appropriacy and variety of the words used; never forget that no word is included in a text just to exist there as part of the decoration.

T: So, what does the title suggest? Who might Martha Quest be? What does quest mean? Why is this a universal experience? Can there be any connection between the word "quest" and this concept of a universal experience?
Ss: "Quest" means "journey", and the word journey is open to multiple interpretations,maybe the journey of life, etc.
T: What kind of a journey is life? Can you draw its picture? Maybe we might draw a road, then after some while, the road might end at a junction where there may appear many other roads: roads taken, and not taken..Now, please draw the picture of life!..

All of the students come to the board and they are given boardmarkers, and all together they try to produce a complete picture of life.
Ss take their texts again, and the class goes on with the analysis of the text. If they like, they might stand rather than sitting in their seats because some Ss feel fatigue and irritated by sitting still for quite a time.

T: How does the paper start?
Ss: It moves from broad to specific, provides the definition of the process/phase of adolescence (*Ss recall the funnel approach in writing the introductions*).
T: What is the thesis statement of the paper? What are the topic sentences?

This, in a way, requires Ss to be able to see the skeleton/outline of the essay, the concept with which they are already familiar from the first term's composition course.

Ss: The thesis statement is "In Martha Quest, Doris Lessing presents a battle field of different forces in the evolutionary maturation process of a young girl, Martha." (*Underlined part indicates the central idea of the thesis, which is very similar to the concept of a controlling idea in a topic sentence; thus, Ss are reminded about this.*)

T: Let's identify the topic sentences and how they are developed -by making use of examples, references, etc.-

This session is carried out by the identification of the topic sentences each time they appear as the whole class reads the text in the supervision of the T. Actually, the T reads the text slowly and Ss interrupt her as the topic sentences emerge. Besides, the Ss need to phrase the topic sentences in their own words if they are implied, rather than being explicitly stated. All possible topic sentences are

discussed, and Ss and the T, as a whole class, decide what the topic sentences are and discussions go on until everyone is satisfied.

Ss: *Possible topic sentences:*

1. In *Martha Quest*, we are presented with a fifteen-year-old girl who feels that all adults in her environmet, especially her mother, are her natural enemies; the phase called parental rejection (developed with references to the book *Martha Quest* itself , Freud, Erikson).

2. As a result of lack of parental support and assurance, Martha, as an adolescent, is fearful of stepping out in the world (developed with references to the book itself).

3. Although Martha, as an adolescent, seeks a new point of view and a model to shape her ego-ideal, she has no such models (developed by examples from the book).

4. Even though the physical changes in the body demand modification of the adolescent's previous body image feelings of (in)adequacy which develop as a result of and in reaction to assessment of others, Martha seems to lack any kind of encouragement from both her parents (developed by examples from the Cognitive Development Theory by Elkind, and references to the book itself).

5. Although Martha wants to manifest adolescent egocentrism (being very much involved in how you look), her parents are unable to encourage her attempts to survive in the outside world and they still try to hold her status down to childhood. (developed with references to the book itself and from the Cognitive Development Theory).

6. Father's being unable to model an independent masculine role/ a strong father figure hinders Martha's development of confidence in her intellectual potential, and educational and occupational attainments (developed with references to the book itself and the experts in Heilbrum's book).

7. In Martha's case, lack of peer group support intensifies the difficulties in working through the problems of adolescence, since adolescents utilize their peer group as a problem solving tool in many ways by expressing their thoughts and feelings without having to struggle against authority (developed with references to the book itself).

8. For the achievement of emotional maturity, adolescents make use of love affair; however, Martha's attempts to turn to a more individualistic mode of existence holds no advantages for emotional maturity (developed with references to the book itself).

T: How about the conclusion? You know we need one in academic papers.

Ss: It is a restatement of the thesis statement: "Martha Quest, as an adolescent, is a self conscious searcher who uses introspection while she actively engages in instrumental behaviour and tries to assess the nature of her actions."

T: Produce the outline of this reserach paper. You might put it down in key words, or draw mental maps, or act it out.

Ss come to the board and they all together prepare an outline of the paper, everyone doing something to complete the outline.

T:Let's analyse the features of the period of adolescence. Is there anyone around you who is in this period? Can you understand them better now? Do you think you have completed your adolescence period? How do you feel about reading Martha's story and learning about the adolescence period? (*All such questions aim to reveal relevant stories in Ss' lives so that they can relate what they have read about and experienced in the class to their lives in general, to the life outside the lesson and the school.*)

T takes students to the computer laboratory to do research on the period of adolescence to answer these questions:
What is adolescence?
What are the stages involved? Any examples, illustrations?

The students are expected to select relevant information from the search results and take notes and get adequately informed about the topic/theme.T provides some more documents about the period of adolescence after Ss' internet search (see Appendix M for the documents on the adolescene period).

T wants Ss to work in groups, and read all the notes and information they have gathered. (Students are put into groups of 6 and they will do group-essay writing.) They organize the information at hand and produce the outline for the essay they are going to write as a group. They are expected to present their outlines to the class; they may do the presentation by words/key ideas, or they might draw the major ideas. They are given large sheets of paper to prepare posters to present their outlines.
A Tentative Outline for the essay (constructed as a whole class):

Introduction: Periof of Adolescence (Definition, Explanation)
1st Dev. Par.: Biological Transition (major changes and their effects)
2nd Dev. Par.: Cognitive Transition (major changes and effects)
3rd Dev. Par.: Emotional Transition (major changes and effects)
2nd Dev. Par.: Social Transition (major changes and effects)
Conclusion: Restate the thesis statement/Wrap up the essay

After the Ss prepare their outlines, they go back to their groups and start writing the essay; while writing the essay, they are advised to imitate the language of the texts they have previously analysed during the lesson (the research paper, teacher's handout on adolescence, and internet documents they have scanned). If the essay cannot be finished during the lesson, they will complete it as an assignment (see Appendix N for a sample group essay written by one of the groups in the class). And upon the completion of it, there will be a little party (simple food and drinks) in the classroom to celebrate their writing of an essay for the first time.

APPENDIX L

MARTHA QUEST: A Universal Experience of Adolescence

By Meral Çileli

APPENDIX M

THE PROCESS OF ADOLESCENCE

(http://www.findarticles.com/cf_0/g2602/0000/2602000013/p5/article.jhtml?term=)

The Period of Adolescence

Sometimes referred to as teenage years, youth, or puberty, adolescence covers the period from roughly age 10 to 20 in a child's development.

Adolescence is a border between adulthood and childhood, and as such it has a richness and diversity unmatched by any other life stage. ... Adolescents are travelers, far from home with no native land, neither children nor adults. They are jet-setters who fly from one country to another with amazing speed. Sometimes they are four years old, an hour later they are twenty-five. They don't really fit anywhere. There's a yearning for place, a search for solid ground.

In the study of child development, adolescence refers to the second decade of the life span, roughly from ages 10 to 20. The word adolescence is Latin in origin, derived from the verb *adolescere,* which means "to grow into adulthood." In all societies, adolescence is a time of growing up, of moving from the immaturity of childhood into the maturity of adulthood.

There is no single event or boundary line that denotes the end of childhood or the beginning of adolescence. Rather, experts think of the passage from childhood into and through adolescence as composed of a *set* of transitions that unfold gradually and that touch upon many aspects of the individual's behavior, development, and relationships. These transitions are biological, cognitive, social, and emotional.

Biological Transition

The *biological transition* of adolescence, or puberty, is perhaps the most salient sign that adolescence has begun. Technically, puberty refers to the period during which an individual becomes capable of sexual reproduction. More broadly speaking, however, puberty is used as a collective term to refer to

all the physical changes that occur in the growing girl or boy as the individual passes from childhood into adulthood.

The timing of physical maturation varies widely. In the United States today, it typically occurs around age 12, although some youngsters start puberty when they are only eight or nine, others when they are well into their teens. The duration of puberty also varies greatly: eighteen months to six years in girls and two to five years in boys.

The physical changes of puberty are triggered by hormones, chemical substances in the body that act on specific organs and tissues. In boys a major change is the increased production of testosterone, a male sex hormone, while girls experience increased production of the female hormone estrogen. In both sexes, a rise in growth hormone produces the adolescent growth spurt, the pronounced increase in height and weight that marks the first half of puberty.

For many years, psychologists believed that puberty was stressful for young people. We now know that any difficulties associated with adjusting to puberty are minimized if adolescents know what changes to expect and have positive attitudes toward them. Although the immediate impact of puberty on the adolescent's self-image and mood may be very modest, the *timing* of physical maturation does affect the teen's social and emotional development in important ways. Early-maturing boys tend to be more popular, to have more positive self-conceptions, and to be more self-assured than their later-maturing peers, whereas early-maturing girls may feel awkward and self-conscious.

Cognitive Transition

A second element of the passage through adolescence is a *cognitive transition.* Compared to children, adolescents think in ways that are more advanced, more efficient, and generally more complex. This can be seen in five ways.

First, during adolescence individuals become better able than children to think about what is possible, instead of limiting their thought to what is real. Whereas children's thinking is oriented to the here and now--that is, to things and events that they can observe directly, adolescents are able to consider what they observe against a backdrop of what is possible--they can think hypothetically.

Second, during the passage into adolescence, individuals become better able to think about abstract ideas. For example, adolescents find it easier than children to comprehend the sorts of higher-order, abstract logic inherent in puns, proverbs, metaphors, and analogies. The adolescent's greater facility with abstract thinking also permits the application of advanced reasoning and logical processes to social and ideological matters. This is clearly seen in the adolescent's increased facility and interest in

thinking about interpersonal relationships, politics, philosophy, religion, and morality--topics that involve such abstract concepts as friendship, faith, democracy, fairness, and honesty.

Third, during adolescence individuals begin thinking more often about the process of thinking itself, or metacognition. As a result, adolescents may display increased introspection and self-consciousness. Although improvements in metacognitive abilities provide important intellectual advantages, one potentially negative by-product of these advances is the tendency for adolescents to develop a sort of egocentrism, or intense preoccupation with the self. Acute adolescent egocentrism sometimes leads teenagers to believe that others are constantly watching and evaluating them, much as an audience glues its attention to an actor on a stage. Psychologists refer to this as the *imaginary audience.*

A fourth change in cognition is that thinking tends to become multidimensional, rather than limited to a single issue. Whereas children tend to think about things one aspect at a time, adolescents can see things through more complicated lenses. Adolescents describe themselves and others in more differentiated and complicated terms and find it easier to look at problems from multiple perspectives. Being able to understand that people's personalities are not one-sided, or that social situations can have different interpretations, depending on one's point of view, permits the adolescent to have far more sophisticated--and complicated--relationships with other people.

Finally, adolescents are more likely than children to see things as relative, rather than absolute. Children tend to see things in absolute terms--in black and white. Adolescents, in contrast, tend to see things as relative. They are more likely to question others' assertions and less likely to accept "facts" as absolute truths. This increase in relativism can be particularly exasperating to parents, who may feel that their adolescent children question everything just for the sake of argument. Difficulties often arise, for example, when adolescents begin seeing their parents' values as excessively relative.

Emotional Transition

In addition to being a time of biological and cognitive change, adolescence is also a period of *emotional transition* and, in particular, changes in the way individuals view themselves and in their capacity to function independently.

During adolescence, important shifts occur in the way individuals think about and characterize themselves--that is, in their self-conceptions. As individuals mature intellectually and undergo the sorts of cognitive changes described earlier, they come to perceive themselves in more sophisticated and differentiated ways. Compared with children, who tend to describe themselves in relatively simple, concrete terms, adolescents are more likely to employ complex, abstract, and psychological self-characterizations. As individuals' self-conceptions become more abstract and as they become

more able to see themselves in psychological terms, they become more interested in understanding their own personalities and why they behave the way they do.

Conventional wisdom holds that adolescents have low self esteem --that they are more insecure and self-critical than children or adults--but most research indicates otherwise. Although teenagers' feelings about themselves may fluctuate, especially during early adolescence, their self-esteem remains fairly stable from about age 13 on. If anything, self-esteem increases over the course of middle and late adolescence. Most researchers today believe that self-esteem is multidimensional, and that young people evaluate themselves along several different dimensions. As a consequence, it is possible for an adolescent to have high self-esteem when it comes to his academic abilities, low self-esteem when it comes to athletics, and moderate self-esteem when it comes to his physical appearance.

One theorist whose work has been very influential on our understanding of adolescents' self-conceptions is Erik Erikson, who theorized that the establishment of a coherent sense of identity is the chief psychosocial task of adolescence. Erikson believed that the complications inherent in identity development in modern society have created the need for a psychosocial moratorium--a time-out during adolescence from the sorts of excessive responsibilities and obligations that might restrict the young person's pursuit of self-discovery. During the psychosocial moratorium, the adolescent can experiment with different roles and identities, in a context that permits and encourages this sort of exploration. The experimentation involves trying on different personalities and ways of behaving. Sometimes, parents describe their teenage children as going through "phases." Much of this behavior is actually experimentation with roles and personalities.

For most adolescents, establishing a sense of autonomy, or independence, is as important a part of the emotional transition out of childhood as is establishing a sense of identity. During adolescence, there is a movement away from the dependency typical of childhood toward the autonomy typical of adulthood. One can see this in several ways.

First, older adolescents do not generally rush to their parents whenever they are upset, worried, or in need of assistance. Second, they do not see their parents as all-knowing or all-powerful. Third, adolescents often have a great deal of emotional energy wrapped up in relationships outside the family; in fact, they may feel more attached to a boyfriend or a girlfriend than to their parents. And finally, older adolescents are able to see and interact with their parents as people--not just as their parents. Many parents find, for example, that they can confide in their adolescent children, something that was not possible when their children were younger, or that their adolescent children can easily sympathize with them when they have had a hard day at work.

Some theorists have suggested that the development of independence be looked at in terms of the adolescent's developing sense of individuation. The process of individuation, which begins during

infancy and continues well into late adolescence, involves a gradual, progressive sharpening of one's sense of self as autonomous, as competent, and as separate from one's parents. Individuation, therefore, has a great deal to do with the development of a sense of identity, in that it involves changes in how we come to see and feel about ourselves.

The process of individuation does not necessarily involve stress and internal turmoil. Rather, individuation entails relinquishing childish dependencies on parents in favor of more mature, more responsible, and less dependent relationships. Adolescents who have been successful in establishing a sense of individuation can accept responsibility for their choices and actions instead of looking to their parents to do it for them.

Being independent means more than merely *feeling* independent, of course. It also means being able to make your own decisions and to select a sensible course of action by yourself. This is an especially important capability in contemporary society, where many adolescents are forced to become independent decision makers at an early age. In general, researchers find that decision-making abilities improve over the course of the adolescent years, with gains continuing well into the later years of high school.

Many parents wonder about the susceptibility of adolescents to peer pressure. In general, studies that contrast parent and peer influences indicate that in some situations, peers' opinions are more influential, while in others, parents' are more influential. Specifically, adolescents are more likely to conform to their peers' opinions when it comes to short-term, day-to-day, and social matters--styles of dress, tastes in music, and choices among leisure activities. This is particularly true during junior high school and the early years of high school. When it comes to long-term questions concerning educational or occupational plans, however, or values, religious beliefs, and ethical issues, teenagers are influenced in a major way by their parents.

Susceptibility to the influence of parents and peers changes with development. In general, during childhood, boys and girls are highly oriented toward their parents and less so toward their peers; peer pressure during the early elementary school years is not especially strong. As they approach adolescence, however, children become somewhat less oriented toward their parents and more oriented toward their peers, and peer pressure begins to escalate. During early adolescence, conformity to parents continues to decline and conformity to peers and peer pressure continues to rise. It is not until middle adolescence, then, that genuine behavioral independence emerges, when conformity to parents as well as peers declines.

Social Transition

Accompanying the biological, cognitive, and emotional transitions of adolescence are important changes in the adolescent's social relationships, or the *social transition of adolescence*.

Developmentalists have spent considerable time charting the changes that take place with friends and with family members as the individual moves through the adolescent years.

One of the most noteworthy aspects of the social transition into adolescence is the increase in the amount of time individuals spend with their peers. Although relations with agemates exist well before adolescence, during the teenage years they change in significance and structure. Four specific developments stand out.

First, there is a sharp increase during adolescence in the sheer amount of time individuals spend with their peers and in the relative time they spend in the company of peers versus adults. Second, during adolescence, peer groups function much more often without adult supervision than they do during childhood. Third, during adolescence increasingly more contact with peers is with opposite-sex friends.

Finally, whereas children's peer relationships are limited mainly to pairs of friends and relatively small groups--three or four children at a time, for example--adolescence marks the emergence of larger groups of peers, or crowds. Crowds are large collectives of similarly stereotyped individuals who may or may not spend much time together. In contrast to cliques, crowds are not settings for adolescents' intimate interactions or friendships, but, instead, serve to locate the adolescent (to himself and to others) within the social structure of the school. As well, the crowds themselves tend to form a sort of social hierarchy or map of the school, and different crowds are seen as having different degrees of status or importance.

The importance of peers during early adolescence coincides with changes in individuals' needs for intimacy. As children begin to share secrets with their friends, a new sense of loyalty and commitment grows, a belief that friends can trust each other. During adolescence, the search for intimacy intensifies, and self-disclosure between best friends becomes an important pastime. Teenagers, especially girls, spend hours discussing their innermost thoughts and feelings, trying to understand one another. The discovery that they tend to think and feel the same as someone else becomes another important basis of friendship.

One of the most important social transitions that takes place in adolescence concerns the emergence of sexual and romantic relationships. In contemporary society, most young people begin dating sometime during early adolescence. Dating during adolescence can mean a variety of different things, from group activities that bring males and females together (without much actual contact between the sexes); to group dates, in which a group of boys and girls go out jointly (and spend part of the time as couples and part of the time in large groups); to casual dating as couples; and to serious involvement with a steady boyfriend or girlfriend. More adolescents have experience in mixed-sex group activities like parties or dances than dating, and more have experience in dating than in having a serious boyfriend or girlfriend.

Although it is incorrect to characterize adolescence as a time when the family ceases to be important, or as a time of inherent and inevitable family conflict, early adolescence is a period of significant change and reorganization in family relationships. In most families, there is a movement during adolescence from patterns of influence and interaction that are asymmetrical and unequal to ones in which parents and their adolescent children are on a more equal footing. Family relationships change most around the time of puberty, with increasing conflict between adolescents and their parents--especially between adolescents and their mothers--and closeness between adolescents and their parents diminishing somewhat. Changes in the ways adolescents view family rules and regulations, especially, may contribute to increased disagreement between them and their parents.

Although puberty seems to distance adolescents from their parents, it is not associated with familial "storm and stress," however. Family conflict during this stage is more likely to take the form of bickering over day-to-day issues than outright fighting. Similarly, the diminished closeness is more likely to be manifested in increased privacy on the part of the adolescent and diminished physical affection between teenagers and parents, rather than any serious loss of love or respect between parents and children. Research suggests that this distancing is temporary, though, and that family relationships may become less conflicted and more intimate during late adolescence.

Generally speaking, most young people are able to negotiate the biological, cognitive, emotional, and social transitions of adolescence successfully. Research indicates that the vast majority of individuals move from childhood into and through adolescence without serious difficulty.

Child Development: Adolescent Stage
(from 11 years of age and through end of adolescence)

- Struggle to develop ego identity (sense of inner sameness and continuity)
- Preoccupation with appearance, hero worship, ideology
- Group identity (peers) develops
- Danger of role confusion, doubts about sexual and vocational identity
- Psychosocial moratorium, a stage between morality learned by the child and the ethics to be developed by the adult

Adolescence(ages between 11 and 17+)

- Parents
- Peers and peer groups
- Identity
- Moral development

Parents:

- adolescence as a necessary time of "storm and stress"
- adolescents in a state of constant rebellion against their parents

- transition from childhood to adulthood is not necessarily a time of turmoil:
    - dramatic decline in amount of time spent with family
    - parents and adolescents negotiate increasing control and independence for the teenager
    - close relationships with parents endure and are conducive to positive development
- conflict:
    - greatest in early adolescence, during puberty
    - usually over everyday details of family life
    - conflict is not over values and beliefs (so-called "generation gap")
    - 5-10% of families suffer severe strains during adolescence - abnormal and help should be sought

Peers:

- adolescents have more friends than children and spend more time with their friends
- changes in the nature of friendships:
    - intimate self-disclosure and mutual understanding become important
    - loyalty and faithfulness stressed
    - share more and compete less
    - friends are similar (age, race, gender, attitudes, aspirations, achievements)

Peer groups:

- Cliques - group of 5-10 individuals who hang around together and who share activities and confidences
- Crowd - large, loosely organised group of people who may or may not spend much time together, but who are identified by the activities of the group
- Peer pressure peaks in mid-adolescence and then declines

*peers provide a standard of comparison and support

*peers exert influence in matters related to style and taste

*parents still exert influence on values, principles and aspirations

*peers reinforce predispositions and behaviors that already existed

Identity:

- A well-organised conception of the self, made up of values, beliefs, and goals to which the individual is solidly committed.
- Constructing an identity is the major personality achievement of adolescence (who am I? what do I value? what are my goals?)

Identity vs identity diffusion:

The psychological conflict of adolescence is resolved positively when adolescents attain an identity after a period of exploration and inner soul-searching.

Problems arise for those who lack:

- trust
- autonomy
- industry

Identity crisis:

A temporary period of confusion and distress as teenagers experiment with alternatives before settling on a set of values and goals.

Identity exploration:

Identity formation usually proceeds in a gradual uneventful manner

Moral Development:

It is proposed that the highest level of moral development for men and women involves integrating the emphasis upon **justice** with an ethic of **care**. The justice orientation provides impartial focus on **rights, laws, and society**. In contrast, the care perspective offers a more **personal focus on relationships and attachment to others**.

APPENDIX N

SAMPLE GROUP ESSAY

Writers:

Introduction:Fatma Akdemir
Biological Transition:Helin Bilinmiş
Cognitive Transition:Kemal Aydın
Emotional Transition:Zeynep Atay
Social Transition:Murat Akgün
Conclusion:Mine Alkış

PROCESS OF ADOLESCENCE

As human beings, we all pass through certain stages in life. Adolescence is one of those stages which we experience between the 10-20. A person who has left his childhood behind and is preparing to be an adult tries to adapt to both internal and external changes throughout this stage. In other words, since he struggles to become a mature he faces some difficulties, chaos, indecisions, etc. in this process .Therefore, experts are doing researches about adolescence and trying to find solutions to these problems. They consider adolescence as a journey of one from his childhood to the adulthood throughout which he experiences some transitions. We will both classify and analyse these transitions as biological transition which means physical maturation, cognitive transition meaning mental maturation, emotional maturation and social transition which means maturation of behaviour in society.

Biological transition is one of these transitions which can be considered as the most obvious sign of the start of the adolescence. The biological transition, puberty, refers to a set of physical changes, a growing girl or boy encounters throughout the passage from childhood into adulthood.The physical changes and the timing of physical maturation usually vary from an individual to another.For example, climatic factors are affecting the timing of physical maturation; in Arabia or in such hot countries, individuals start puberty earlier than their peers living in different countries.The duration of puberty also changes in boys and girls.The physical changes are also related with some hormones.In puberty the physical changes are stimulated ,by hormones chemical substances secreted from specific organs and tissues.These hormones are different in boys and girls.In boys, these changes are triggered by testosterone, while in girls, they are triggered by female hormone, estrogen.All these physical changes in puberty affect the individual emotionally, as well because of this, for many years it was thought that the changes effect young people in a stressful way, but today it is thought that , if what changes are expected are known by young people, the difficulties associated with adjusting the puberty can be minimized and young

people can have, with the help of this, a positive attitude towards them. The timing of physical maturation also affects the teen's social and emotional development, as well.By the help of knowing what to expect from puberty, the teens can adapt to their cognitive, emotional and social transitions easily and effectively.

Besides biological transition,there is another transition in adolescence –cognitive transition- during which the adolescent experiences diferences in their ideas, proces of thinking and self evaluation.Firstly, in childhod, people see everything as concrete and real.However, in adolescence people start to be able to think the possibilities rather than realities and think hypothetically.For example, a child canot think criticaly on an issue, but it is possible for an adolescent.Secondly, adolescent can think about abstract ideas diferent from a child. As an example, we can say that, understanding metaphors and proverbs is hard for children, but adolescents can understand them easily. Thirdly, adolescents begin to consider the proces of thinking itself and focus on themselves, their atitudes, their apearances ect.In other words, they begin to feel themselves as individuals, parts of the society with the help of their developing social characters. Finally, adolescents have the ability to think multidimensionally.They can focus on more than one issue at a time.As well known, children cannot focus on more than one thing, they can only focus on one isue.

In adolescence, the changes seen in adolescents are not only biological and cognitive but also emotional and the adolescents try to form their emotional world.They try to perceive and give meaning to the events, people and objects around them but it isn't always easy, they start to see those things in a different point of view. In their childhood, they interpret other presences relatively simple, as they just look, but in adolescence, they also see and comment not only look.At first, they try to adapt to this process; looking, seeing and interpreting, then they try to put themselves into this process.They think themselves like an alien, different from others. According to them, nobody can understand and know what they feel; this is adolescent egocentrism.At the end, they try to isolate themselves or want to be with people who are in the same period with them.That means peers gain importance.In their childhod, whenever they have a problem, they run to their parents, because they know that parents are always powerful and have knowledge, but in adolescence, it completely changes.They think that their parents are not good.Adolescents model for themselves, so friendship starts to improve. They want to be with their peers as they are the same and understand each other.Moreover, peers don't interrogate them, just accept however they are, but parents and other people don't do this.They questioning the adolescents.This process is a different and perplexing process for parents too,so they have some difficulties while understanding adolescents.They try to discaler the adolescent who is an individual with questions.However the answers are not generally satisfactory so they have quarrels.These quarrels make both side unhappy. In order to get away from this so-caled trouble, they choose a girlfriend or boyfriend and share their emotions with him/her.They feel a bit relaxed when they spend time with their peers, because they see that not only themselves are in that situation, there are others, as well. However, understanding that they aren't alone in this puberty process and so,relaxing is not exact solution .There is one more

problem ; their status in the society.They want to know if they are adult or child.This perplexing situation makes them feel in a great complexity.They don't know how to behave like: an adult ,or a child.At the end, generaly, they try to behave like an adult but they don't know how.They watch other adults and try to imitate, but this causes other problems. As a result, they feel themselves worthless, strange, not belonging to anywhere, complex and a closed box which hasn't a key.Adolescents believe that the key isn't with their parents or adults who are around them but other people; in other words,societywhich does not include their own parents.As a result of this belief, adolescents start to understand what being a social creature means.

As the child gets older, he always meets with new people and broadens his relation group. During adolescence years, adolescents' social group changes from the family to the friends and gets larger. As they need someone to share their problems they face during that time, they make new friends.Adolescents trust their friends and can easily talk with them about their problems and the changes of adolescence, because they all live the same period and have the same problems.In other words, they don't need to secret anything from each other.On the other hand, they don't talk to their families openly.They feel ashamed to talk with their parents about such matters so they choose their peers and these are usually their friends not their brothers or sisters. However, sometimes they consult to their elders as they have experienced this period previously and have the useful knowledge for the adolescents.During this period, adolescents usually choose opposit-sex friendships because they are so sendemental and want to make romantic relationships.Most of them have experience in dating rather than in having a serious relationship with a boy or girl.The borders of relation usually gets broaden and they participate in group activities.Usually, these groups consist of friends from both sexes.They often organize these activities with school friends and always meet with new faces.In that way they learn how to act as a group, so trust and loyalty improve among the individuals.

As it has already been stated in the paragraphs above, during adolescence, the adolescents experience some difficulties to adapt to the changes.They can't easily get used to the biological changes, they start to look at the world from a far more different point of view than they do in childhood, they begin to see the emotional sides of everything around and they tend to be with peers more than parents.To summarize, the adolescence is a road on which the adolescents are accompanied by the changes in their physical apprearences, thoughts, feelings and relationships.Since these changes are too difficult to adapt to, they should be helped and not be left alone during such a significant and critical period which is highly effective on the characteristic of a person.