REPUBLIC OF TURKEY
CUKUROVA UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES
DEPARTMENT OF ENGLISH LANGUAGE TEACHING

INFUSION OF CRITICAL THINKING SKILLS INTO HIGH SCHOOL 10th GRADE EFL CLASSES

EMRAH AKDAĞ

MASTER OF ARTS

ADANA / 2018

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To Çukurova University Institute of Social Sciences

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Emrah AKDAĞ

ÖZET

ELEŞTİREL DÜŞÜNME BECERİLERİNİN ORTAÖĞRETİM 10. SINIF İNGİLİZCE DERSLERİNE SUNULMASI

EMRAH AKDAĞ

Yüksek Lisans Tezi, İngiliz Dili Eğitimi Ana Bilim Dalı
Danışman: Prof. Dr. Yasemin KIRKGÖZ
Haziran 2018, 96 sayfa

Günümüz dünyasında, hızına ayak uydurmakta güçlük çektiğimiz birçok değişiklik meydana gelmektedir. İçinde bulunduğumuz yüzyılın beraberinde getirdiği teknolojik gelişmeler, ülkeler arasında ciddi bir rekabete yol açmaktadır. Bu rekabet insanların geleneksel ve sıradan becerilerin çok ötesinde birtakım yeteneklere sahip olmaları gerekliliğini doğurmuştur. Eleştirel düşünme becerileri bunların başında gelmektedir ve uluslar eğitim sistemlerini bu gerekliliğe göre şekillendirmektedirler.

Eleştirel düşünme, eğitimin kaçınılmaz hedeflerinden biri olarak düşünülmelidir. Çünkü düşünme becerileri, hızlı değişimle karakterize olmuş bir toplum için çok gereklidir. Bu sebeple, bilişsel gelişimin öneminin gittikçe arttığı dünyamızda öğrencileri efektif düşünürler olarak yetiştirmek ve onlara üst düzey düşünme becerileri kazandırmak, eğitim politikasının temel amaçlarından biri olmalıdır. Son yıllarda Milli Eğitim Bakanlığı tarafından hazırlanan öğretim programlarında eleştirel ve üst düzey düşünme becerilerinden bahsedilmektedir. Ancak yine bakanlık tarafından hazırlanan ders kitaplarında ve yardımcı kaynaklarda, eleştirel düşünceye ait aktivite ve egzersizler bulunmamaktadır. Bu durum, öğrencilere üst düzey düşünme becerilerini kavratmada bilhassa öğretmen açısından çok büyük bir dezavantaj yaratmaktadır. Bu eksikliğin giderilmesi açısından ülkemizde yapılmış bir takım araştırmalar mevcuttur. Ancak kısıtlı sayıdaki bu araştırmalar, ülkemizdeki tüm eğitim kurumlarını kapsayacak şekilde bir uygulanabilirlik sunamamaktadır. Bu alandaki eksiği gidermek adına büyük ölçekte çalışmalar yapılmalı ve Milli Eğitim Bakanlığı bünyesinde müfredat ve materyal geliştirme çalışmaları yapılmalıdır.

Araştırma 2017 – 2018 Öğretim yılını ve Çukurova Emine Nabi Anadolu

Lisesi'ndeki 131 adet 10. Sınıf öğrencisini kapsamıştır. Çalışma bir örnek vaka incelemesi olup, 10. Sınıf İngilizce öğretim programına eleştirel düşünme becerilerinin sunulması, bir öğretim yılı boyunca öğrencilere bu yeni programa göre ders anlatılması ve sonuçların değerlendirilmesi temeline dayanmaktadır. İlk etapta öğrencilere bir anket verilmiş ve eleştirel düşünme düzeyleri tespit edilmiştir. Öğrencilere yeniden oluşturulmuş ders planları doğrultusunda aktiviteler ve görevler verilmiş ve eleştirel düşünme düzeyleri sınıf içerisinde belirli aralıklarla gözlenmiştir. Öğretim yılı sonunda verilen bir anketle de öğrencilerin eleştirel düşünme becerilerindeki gelişme seviyesi ölçülmüştür.

Gerek final anketi gerekse karşılıklı görüşme sonucunda elde edilen veriler, eleştirel düşünce görevleriyle yeniden modellenmiş ders planları ışığında yapılan İngilizce derslerinin, öğrencilerin eleştirel düşünce becerilerine sahip olmalarını büyük oranda sağladığını ortaya koymuştur. Araştırma sonuçları ve ürünleri, yabancı dil öğretmenleri ile bakanlık bünyesindeki program ve materyal geliştiricileri için kayda değer bir öneme sahiptir. Ayrıca bu araştırma, alanda yapılacak benzer çalışmalar için de implikasyonlar içermektedir.

Anahtar Kelimeler: Eleştirel düşünce, eleştirel düşünce öğretimi, üst düzey düşünme becerileri, eleştirel düşünce infüzyonu.

ABSTRACT

INFUSION OF CRITICAL THINKING SKILLS INTO HIGH SCHOOL 10th GRADE EFL CLASSES

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Master Thesis, English Language Teaching Department
Supervisor: Prof. Dr. Yasemin KIRKGÖZ
June 2018, 96 pages

In today's world, there are many changes that we struggle to keep pace with. The technological developments brought about by the century in which we are have led to a serious competition among the countries. This competition has resulted in the necessity for people to have some abilities beyond traditional and ordinary skills. Critical thinking skills are at the forefront of them; and nations shape their education systems according to this necessity. Critical thinking should be considered as one of the inevitable goals of education. Because, thinking skills are very necessary for a society characterized by rapid change. For this reason, educating students as effective thinkers in our world of cognitive development ought to be one of the main objectives of education policy.

In recent years, Critical Thinking (CT) and Higher Order Thinking (HOT) skills have been mentioned in the curricula prepared by the Ministry of National Education. However, there are not specific activities and exercises enhancing critical thinking abilities in the textbooks prepared by the ministry and in supportive resources. This leads to a tremendous disadvantage particularly for teachers in getting students to comprehend high – level thinking skills. There are a number of studies in our country in terms of eliminating these deficiencies. However, these limited studies do not provide any applicability to cover all the educational institutions in our country. In order to make up for this deficit, research should be carried out on a large scale. Additionally, curriculum and material development studies should be conducted within the Ministry of National Education.

The study covered the 2017 - 2018 Academic Year and 131 10th grade students in Emine Nabi Anatolian High School in Çukurova. The study was an exploratory case

study, based on infusing critical thinking skills into the 10th grade English curriculum, doing the lessons according to remodeled unit plans during one academic year and evaluation of the results. At the first stage, students were given a questionairre and their critical thinking levels were determined. Activities and tasks were given to the students in line with the remodeled lesson plans and their level of critical thinking was occasionally observed during classes. With a final questionairre given at the end of the academic year, the level of development in students' critical thinking skills was measured.

Data obtained from both the final questionairre and the face – to – face interviews have revealed that the English lessons done in the light of the remodeled lesson plans with critical thinking tasks substantially provided students with critical thinking skills. The results and products of this study have significant importance for language teachers, curriculum and material developers within the ministry. This research also includes implications for similar studies to be conducted on the field.

Keywords: Critical thinking, teaching critical thinking, higher order thinking skills, high school English curriculum

ACKNOWLEDGEMENTS

First of all, I am grateful to my supervisor Prof. Dr. Yasemin KIRKGÖZ who gave me all her support and motivation during the research. She was always there without hesitation whenever I needed her counsel, which was priceless indeed.

It would be a great deal of ingratitude if I did not speak of dear Assoc. Prof. Dr. Yonca ÖZKAN, who provided me with significant knowledge in terms of research and scholarly life. It was a privilege to write an article with her and to share moments full of science.

I also would like to thank Assoc. Prof. Dr. Hasan Bedir for his guidance and professional advice. His permission to make use of critical thinking questionnaires prepared by him and his contribution in the field means a lot to me.

Each member of Cukurova University English Teaching Department has given very precious support to me and opened new horizons ahead of me. Although I cannot mention them individually here, I do owe much to every one of my lecturers who taught me what I needed to be able to conduct research and write this thesis, thereby becoming a successful researcher.

My special thanks go to my wife, my family and my beloved friends who were always by my side with all their sincerity and faithfulness.

Finally, I would like to thank my students, also the participants of this study, for all their enthusiasm and willingness during the research.

Emrah AKDAĞ

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LIST OF ABBREVIATIONS

CT: Critical Thinking

CTS: Critical Thinking Skills

HOTS: Higher Order Thinking Skills

EFL: English As a Foreign Language

SPSS: Statistical Package for Social Sciences

MEB: Ministry of National Education

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CHAPTER I

INTRODUCTION

1.1. Introduction

"Cogito ergo sum. (I think, therefore I am.)"

René Descartes

The concept of "thinking" dates back to the ancient history of mankind; and since the great philosopher Socrates, some people have used their minds and logic to go for the better, thereby paying the price for it with their lives at times. These only a few philosophers made great efforts to carry humanity further. There is no doubt that their efforts made a great contribution to open out the gates of today's development.

Today's people are exposed to very intense information and technology bombardment thanks to constantly and rapidly changing world of technology and information, which makes them have difficulty in keeping pace with such an epoch as ours. Thus some new skills have accordingly become crucial especially in the last a couple of decades. These new skills are called "21st Century Learning and Innovative Skills" by many (Pearlman, 2010; Trilling & Fadel, 2009; Saavedra & Opfer, 2012), and *Critical Thinking Skills* (CTS from now on) are considered pivotal part of them. Paul and Elder (2006) stated that good thinking will always be beneficial for people whatever jobs they have; whereas bad thinking will bring nothing but problems, pain and disappointment in life. This is why individuals have to build up their own particular manners of intuition by evaluating the current information so as to be fruitful in their lives and careers. They also require certain thinking and reasoning skills, included in CTS, to be aware and to accommodate themselves to the changing world.

One of the Higher Order Thinking Skills (HOTS from now on) which enable to go further than basic observation and perception, Critical Thinking (CT from now on) has lately been explored and discussed by instructors, academicians and researchers inasmuch as it gives people various advantages extending from encouraging the efforts to understand the world to evaluating the provided information from various diverse perspectives and criteria. In addition, it enhances the very nature of thought and human life by motivating one to move far from lies, deceptions, authoritative opinions, false convictions, and ungrounded contentions (cited from criticalthinking.org). Despite the fact that CT has been acknowledged and accepted as an important subject for not a long

time, it has roots dating back to ancient Greek (Facione et al., 1995). This is probably the reason why sometimes in different names but the same meaning, thinking critically has always been among the most debated concepts in scholarly life.

A growing body of research has been conducted on teaching CTS worldwide, and researchers on the field have gathered a great many positive results from their studies. Halpern (1998) stated that various studies have revealed the fact that critical thinking, characterized as the ponder utilization of abilities and strategies that expand the likelihood of a targeted result, can be learned in ways that elevate transfer to novel settings. Governments have contended that it is essential for all areas of education to prepare people who can think well. Thinking well or good thinking is what it is meant by critical thinking actually. In recent years, scholars have worked on the methods and conceptions to enhance critical thinking instruction. Furthermore, several countries have infused CTS into their curricula and have raised teachers according to foster CTS in their instructional practices.

In Turkey, a radical change was made in the primary curriculum which was written to equip students with skills such as critical thinking, problem solving and creative thinking (Kirkgoz, 2008). Additionally, CTS are mentioned in high school curricula. As we know it today in Turkey, schools do not teach CTS to their students specifically and effectively. This can be claimed according to PISA 2012 results. Aybek (2006) states that contemporary instructors do accept that a population which does not consist of people with CTS cannot go further and cannot make any advancement. For this reason, the duties of schools are persistently expanding with the goal that they can lead the adjustments in each field of life.

1.2. Background to the Study

The crescendo significance of CT has constantly been recognized in educational life all over the world, and the concept “thinking” is of pivotal importance in getting information of continually changing and developing world. As Socrates and other philosophers stated, CT is on the center point of not solely intellectual but also social advancement. As many scholars like Hashemi (2011) have claimed so far, thinking plays a dominant role in any education system (p. 64). This is why schools are probably the best places to learn about CT and to develop CTS. Therefore, the nations that aim to teach thinking skills to their children consider teaching CT as a significant priority. Because,

they already know students are supposed to grow up as questioning individuals during their lifetime. McCrae (2011) supports the idea that students ought to be incited to think for their own instead of acknowledging the wisdom generally accepted. Supporting this idea, Ozkan (2010) suggests that a student who has the ability to consider critically can inquire suitable questions, assemble pertinent information,
effectively and imaginatively sort through this information, reason coherently from this information, and come to reliable conclusions about the world that empower one to live and act well, thus putting an emphasis on the significance of CT in education.

Though there is a substantial amount of debate on what age is the best for teaching CTS, a growing body of research suggests that it is important at even every age. McKendree et al. (2002) pointed out the fact that thinking skills have recently been emphasized persistently by educational policy makers. In educational programs, it is widely accepted that developing thinking skills which are learnt in classrooms and can be conveyed to other fields of life is as important as improving the individual potential at the highest level (Kurt & Kurum, 2010).

As a matter of fact, the Turkish Ministry of National Education defends the idea that a constructivist approach should be based on in the curricula rather than a behavioral approach. The program is based on the assumption that each child is an "original", "unique" and "respectable" individual. The program emphasizes senior mental processes such as research, investigation, questioning, planning, critical thinking and decision making. Not only product, but process is evaluated as well (MEB, 2006).

Nowadays an important development that necessitates CT is information explosion. Knowledge is increasing day by day and changing. Since it is impossible to integrate the rapidly growing and changing information into educational programs at once and present it to the students, it is necessary for the students to gain the knowledge of CTS and to develop the principles and methods of accessing and acquiring the necessary knowledge and understanding of that knowledge (Aybek, 2006). In primary education (MEB, 2006) and high school (MEB, 2011) programs, it is apparent that CT has been given special importance. In these programs, CTS are regarded as one of the skill types that must be found in the members of the information society as well as being considered as basic skills to be gained to the students (Korkmaz, 2009).

In addition, based on work done in and out of Turkey; it has been seen that an education system on which critical thinking is based increases academic success in the students (Akınoğlu, 2001, Facione & Facione, 1997, Ip et al, 2000; Zayif, 2008). More

importantly, when critical thinking education is part of continuing education, students are not only more successful in academic terms, but are also socially more positive and more helpful and less addictive (Elias & Kress, 1994).

1.3. Statement of the Problem

Thinking is doubtlessly one of the greatest talents bestowed upon humanity. For humans to improve thinking ability is directly proportional to its efficient use. The way of our thinking in everyday life is apparently separated from the way of thinking in the scientific area by clear lines. One of the functions of today's educational institutions is unquestionably to give scientific thinking skills to individuals. Therefore, teaching students to think right is among the most important duties of schools (Gulveren, 2007).

At the present time, there is a great need for individuals who can think critically and question logically, and great importance is attached to the training of these individuals. An opportunity should be provided to develop educational programs essential for teaching critical thinking (Ekinci & Aybek, 2010). For Gibson (1995), thinking is as natural as breathing; yet, good thinking does not occur spontaneously and education is indispensable for this to come true. The positive relation between CT and school success necessitates infusing critical thinking in educational programs. A growing body of research has revealed that CTS are directly proportional to IQ tests (Royalty, 1995) and students with CT abilities have high success rate at school (Facione, 1998; Kazancı, 1989, p.34). Facione (1998) stated that individuals who do not have CTS and attitudes are not trained in quality and quantity. Besides, for the development and sustainability of democracy culture in communities, one of the most crucial abilities is CTS. For Ozden (1998, p,142), the most significant need in societies with advanced democracy is to raise citizens equipped with CTS. It is imperative that humans should have CTS so as to get rid of certain provisions and prejudices (Ruggiero, 1988; cited in Ekinci & Aybek, 2010).

Especially with the advent of information technologies, information has already started to foster and spread in an unprecedented speed; thereby affecting individuals' cognitive processes deeply. Broad and widespread information provided by web-based technologies has formed the basis of the alteration in person's educational process. The person is faced with a wide selection of choices of appropriate and useful information to support the solution of problems. This process requires deeper functioning of individual's critical and creative thinking abilities (MEB, 2006, p.168). One of the main abilities

forming the educational programs of the Turkish Ministry of Education is CTS, and these include a number of sub skills.

Beyond all these accounts, CTS are essential to lead a prosperous life and to develop healthy relationships with other people in the society. Hence, it is necessary that CTS should be given to students at schools especially in their adolescence period, which corresponds to high school level, during which young people start to be aware of facts and create opinions. As well as raising well-trained teachers at faculties, modern curricula and syllabi in which CT infusion models and practices take place need to be developed. As Socrates once stated "I cannot teach anybody anything. I can only make them think".

In Turkey, English is taught to students from the 2nd grade to the 12th grade as a compulsory subject both in state and private schools. The curriculum is based on communicative and constructivist principles, and the students are expected to use four skills of English language, which are listening, speaking, reading and writing. However, there are no particularly infused CT skills in the English programs; nor are the materials including CT practices developed. Even though CT skills are mentioned in the curriculum and are among the objectives of the national education policy, neither teachers nor students can reach the material supporting CT skills acquisition. Therefore, a study of infusing CT principles into English curriculum through remodeled lesson plans and critical thinking tasks is necessary in order to make up for the lack previously mentioned.

1.4. Purpose of the Study

In "High School English Teaching Program (9th, 10th, 11th and 12th class) released in 2018, CTS are explicitly mentioned (MEB, 2018, p. 15). Besides the programs are said to aim to develop students' problem solving skills (MEB, 2018, p. 44). Moreover, the importance of processing knowledge rather than rote memorization is frequently implied in the curriculum. For this reason, teachers should be aware of CTS and help their students gain these skills accordingly.

In this context, the main purpose of this study is to contribute to the field seeing that there are not enough studies on infusion of CTS into high school language curricula. This study also explored the CT levels of the students prior to the implementation of CTS infusion; and investigated the potential effects of the CTS infusion into curriculum on the 10th grade English learners through remodeled lesson plans and authentic tasks.

In addition, this study resulted in serious original tasks, materials, and remodeled lesson plans as end-products, which might be utilized in textbooks and material development in future.

1.5. Research Questions

With this study, the answers to the following questions were sought:

1- To what extent are 10th grade English learners aware of critical thinking strategies prior to the infusion of critical thinking skills?
2- Does infusing critical thinking skills into English classes have an effect on participants' dispositions of thinking critically? If so, in what ways?
3- How do the participants perceive the critical thinking tasks?
4- To what extent do the participants develop critical thinking skills after the infusion process?

1.6. Limitations

Even though there were 131 participants included in this study and all the data obtained was genuine, the results might not be valid for other test groups. Moreover, some variables such as age, social and educational background of the participants might probably differ in different contexts. Therefore, the results of the study cannot be generalized and can be considered to have an error probability.

1.7. Operational Definitions

Critical Thinking: Critical thinking is that mode of thinking – about any subject, content, or problem — in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them (Paul & Elder, 2001, p.18).

Critical Thinking Infusion: An approach based on direct instruction in which thinking is blended into content lessons (1998 Critical Thinking Books & Software – www.criticalthinking.com).

Task: A usually assigned piece of work often to be finished within a certain time https://www.merriam-webster.com/dictionary/task).

EFL: Abbreviation for English as a Foreign Language: the teaching of English to students whose first language is not English. (https://dictionary.cambridge.org/dictionary/english/efl

Remodeled Plan: A lesson plan which that was critiqued formulated based on the critical process (Paul et al., 1989)

L2: The language which is not the native language of a speaker.

CHAPTER II

LITERATURE REVIEW

2.1. Introduction

This chapter deals with the 21st century skills and learning, critical thinking concept, critical thinking skills and strategies. Additionally, it provides a deeper look into critical thinking education and the infusion method used to transfer critical thinking skills into English curriculum. It also examines a large quantity of research and a number of studies on teaching critical thinking skills through infusion model.

2.2. 21st Century Learning

It is an inevitable fact that our world has been undergoing a dramatic and tremendous change particularly in the last a few decades (Bellanca, 2010, p. 13; Saavedra & Opfer, 2012, p. 2; Trilling & Fadel, 2009, p.23; Voogt & Roblin, 2012), and this change requires mastering several skills like digital media literacy which was beyond imagination five decades ago (Trilling & Fadel, 2009, p.23). To support this idea, Richard Riley, Former Secretary of Education of the USA, stated that the most favored 10 jobs existing today will be extinct in the near future, and we have to raise our children appropriate for the professions that do not exist at present.

The world order which was based on industry and labor shifted to knowledge – based, thus necessitating some innovative skills. Trilling and Fadel (2010) explain this case as:

> *"This monumental shift from Industrial Age production to that of the Knowledge Age economy—information-driven, globally networked—is as world-changing and life-altering as the shift from the Agrarian to the Industrial Age three hundred and fifty years ago"* (p. 3).

Pearlman (2010) states that countries have already recognized the 21st century knowledge and skills not solely based on content knowledge but information and communication skills, thinking and problem solving skills and the skills so as to use the tools of 21st century like information and communication technologies (p. 119). Therefore

a new learning style has developed which is called *21st Century Learning*. Trilling and Fadel (2010) refer to this case as:

> "*Achieving education's goals in our times is shaped by the increasingly powerful technologies we have for communicating, collaborating, and learning. And learning assumes a central role throughout life."* (p. 16).

It is an inevitable fact that the economy has been globalized and populations have increasingly been diverse and interconnected, and thus individuals encounter new confrontations. Accordingly educational institutions are reconsidering the skills and educational approaches to contribute students with the skills necessary for the new era (Saavedra & Opfer, 2012, p. 2). As such an attention for the competences of knowledge society emerged, educational institutions and schools are required to make alterations in their curricula (cf. European Commission 2002, OECD 2004, Voogt and Pelgrum 2005).

Partnership for 21st Century Learning (aka P21) developed a framework called *Framework for 21st Century Learning* on the basis of the data gathered from instructors, education experts and business directors to characterize and clarify the skills and knowledge that learners require to be successful in their lives, professions and citizenship according to the necessities of 21st century learning elements. Since then, a great many instructors and schools have been utilizing the framework so as to place the 21st century skills to the very center of learning. The P21 Framework demonstrates 21st century student outcomes and support systems.

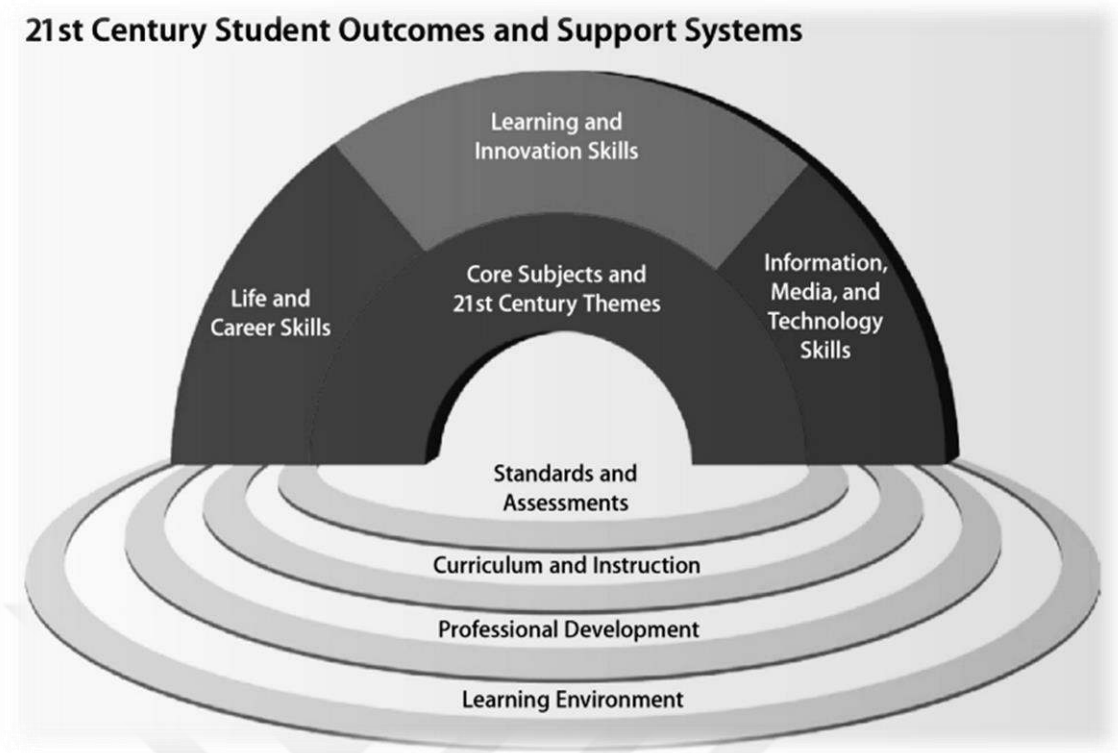

Figure 1: P21 Framework for 21st Century Learning
Source: http://www.p21.org

At the top of the framework are *Learning and Innovation Skills* which have progressively been admitted as the skills that distinguish learners prepared for the requirements of the 21st century from others. These skills which are crucial for learners to cope with the challenges of the new epoch are as following:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication
- Collaboration

This study focuses on *Critical Thinking* skills and aims to shed light to the significance of acquiring these skills.

2.3. Critical Thinking Definitions

"No problem can be solved by the same consciousness that created it. We need to see the world anew" once stated Einstein (1947, p.7), thereby mentioning the significance

of *Critical Thinking* (CT) though not directly. Philosopher and educational reformer Dewey (1910) put forward the idea that if we accept any suggestion as soon as it comes up, it means we cannot think critically, which indicates the lowest level of reflection. Such prominent scholars doubtlessly did not discover the territories already stepped on by a number of great thinkers but revisited them. They put the emphasis on the fact that an individual should look deeper beyond what is seen by questioning and evaluating. Although not precisely known, it is widely accepted that the origins of CT date back to Greek philosopher Socrates (c. 470 BCE – c. 399 BCE), who created a probing questioning technique called *Socratic Questioning* which is still used by many today. Apparently since the ancient times to our era, CT has been developed and flourished without losing any of its significance over time.

The question of "What is critical thinking?" has always been at the very center of the literature concerning critical thinking (Beaumont, 2010; Beyer, 1985; Ennis, 1990; Fisher, 2001; Fisher & Scriven, 1997; Moran, 2012; Van Gelder, 2001). A number of scholars have made various definitions of the term so far, yet these definitions vary in shape though not in context. Dewey (1909) did not use CT term but defined *Reflective Thinking* as an "active, persistent and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends" (p. 11). He apparently described the thinking process as an active process, thus opposing the idea that information can only be received from someone else in a passive manner. For Dewey (1933), people find reasons to believe in something, and they also have natural tendency to find justifications for what they perform. This interpretation is particularly significant in terms of putting the emphasis on reasoning in CT. Ennis (1989) defined CT as sensible and intelligent thinking centered around choosing what to accept or do. He unequivocally talks about CT dispositions and skills by making reference to a CT agenda called FRISCO. For Ennis (2011), ideal critical thinkers should be disposed to care that their ideas are true and can be justified as well as caring to comprehend a situation clearly and in an honest manner. Critical thinkers are also supposed to care about everyone since critical thinking might be dangerous without it. They put forth two basic dispositions which are *logical reasoning* and *representing positions honestly and clearly* so as to become a successful critical thinker. Like Ennis, some other researchers put forward numerous definitions and thoughts in regards to the attributes of CT, the CT dispositions, and additionally instructor and learner practices that show some insufficiency in CT (Lipman, 2003; Pithers & Soden, 2000; Zhang, 2003).

Lipman (2003) suggests that CT depends on certain criteria as well as being self – correcting, contextually sensitive and intellectually empowering (p. 34).

In larger context, CT has been defined as a skill to interrogate; to recognize and test already held suppositions; to perceive ambiguity; to inspect, interpret, assess, reason and reflect; to settle judgments and choices; and to clarify, express and legitimize positions (Ennis, 1962; Halpern, 1996; Holyoak & Morrison, 2005; Hullfish & Smith, 1961; Kitchener, 1986; Mines & King, 1990; Pascarella & Terenzini, 1991; Paul & Elder, 2001; Petress, 2004). Yet, a more acknowledged and comprehensive definition came from Michael Scriven and Richard Paul (1987) at the 8th Annual International Conference on Critical Thinking and Education Reform:

> *"Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action".*

This conceptual definition of CT was clarified and enriched by Richard Paul and Linda Elder; and it was developed into Paul – Elder (2001) framework of critical thinking, which is:

> "*Critical thinking is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way. People thinking critically consistently attempt to live rationally, reasonably, empathically. They are keenly aware of the inherently flawed nature of human thinking when left unchecked*" (cited from http://www.criticalthinking.org/pages/defining-critical-thinking/766)

Today, this is description considered one of the most referenced and utilized frameworks in CT literature.

2.4. Critical Thinking Strategies

CT strategies were developed and presented by Paul, Binker, Jensen and Kreklau in 1990. These 35 dimensions (also called aspects or instructional strategies) have widely

been used in CT infusion through remodeled lesson plans and tasks. The following list is grouped into three sections which are *affective strategies, cognitive strategies – macro abilities* and *cognitive strategies – micro abilities.* All the strategies will not be addressed one by one; yet merely the most specific ones appropriate for high school context are going to be elaborated and used in remodeled lesson plans.

The list below was taken from *http://www.criticalthinking.org/pages/strategy-list-35-dimensions-of-critical-thought/466#s1*.

2.4.1. Affective Strategies

- S-1 Thinking Independently
- S-2 Developing insight into egocentricity or sociocentricity
- S-3 Exercising fair-mindedness
- S-4 Exploring thoughts underlying feelings and feelings underlying thoughts
- S-5 Developing intellectual humility and suspending judgment
- S-6 Developing intellectual courage
- S-7 Developing intellectual good faith or integrity
- S-8 Developing intellectual perseverance
- S-9 Developing confidence in reason

2.4.2. Cognitive Strategies - Macro-Abilities

- S-10 Refining generalizations and avoiding oversimplifications
- S-11 Comparing analogous situations: transferring insights to new contexts
- S-12 Developing one's perspective: creating or exploring beliefs, arguments, or theories
- S-13 Clarifying issues, conclusions, or beliefs
- S-14 Clarifying and analyzing the meanings of words or phrases
- S-15 Developing criteria for evaluation: clarifying values and standards
- S-16 Evaluating the credibility of sources of information
- S-17 Questioning deeply: raising and pursuing root or significant questions
- S-18 Analyzing or evaluating arguments, interpretations, beliefs, or theories
- S-19 Generating or assessing solutions

- S-20 Analyzing or evaluating actions or policies
- S-21 Reading critically: clarifying or critiquing texts
- S-22 Listening critically: the art of silent dialogue
- S-23 Making interdisciplinary connections
- S-24 Practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives
- S-25 Reasoning dialogically: comparing perspectives, interpretations, or theories
- S-26 Reasoning dialectically: evaluating perspectives, interpretations, or theories

2.4.3. Cognitive Strategies - Micro-Abilities

- S-27 Comparing and contrasting ideals with actual practice
- S-28 Thinking precisely about thinking: using critical vocabulary
- S-29 Noting significant similarities and differences
- S-30 Examining or evaluating assumptions
- S-31 Distinguishing relevant from irrelevant facts
- S-32 Making plausible inferences, predictions, or interpretations
- S-33 Giving reasons and evaluating evidence and alleged facts
- S-34 Recognizing contradictions
- S-35 Exploring implications and consequences

2.4.4. S-1: Thinking independently

Critical thinking means thinking for oneself, which can be called autonomous thinking. We mostly acquire our beliefs and moral values when we are children especially from those we are raised among. Therefore we generally tend to believe in irrational things inasmuch as we are not able to question whether or not a piece of information is true. Moreover, we are often told off by the elders when we try to question the logic of any idea. Namely, the very first patterns to construct humans' beliefs are mainly their elders' impositions upon them. However, critical thinkers are capable of thinking independently and distinguish the good from the bad. They do not accept ideas or beliefs in a passive manner but constantly question the logic beneath the ideas. Besides, they are

able to associate relevant information with their knowledge and practice, which provides them with the ability to resist manipulation.

2.4.5. S-2: Developing insight into egocentricity or sociocentricity

Egocentricity is described as the confusion of instant perception with reality (Paul et al., 1990). It is the state of ignoring or neglecting others' points of view by putting one's beliefs to the highest point, which is a very clear indicator of lacking critical thinking. Egocentric people feel they are 100% right every time and reluctant to adopt the ideas which do not appeal to their gratification. As individuals join in society and become socialized, egocentricity gradually turns into sociocentricity, and "I" becomes "We". The individuals then begin to identify themselves only through the group they belong to. The state of refusing other individuals' ideas or beliefs evolves into refusing other groups' ideas or beliefs. Both egocentricity and sociocentricity are morbid. But Paul et al., (1990) maintain that since these states are both disease, the cure is the self – awareness. Either as an individual or as a member of a group, everyone needs to be aware of themselves and recognize other people's beliefs in addition to making true assumptions on which they can base their reasoning.

2.4.6. S-3: Exercising fair-mindedness

Critical thinking requires the ability to evaluate the contradicting ideas or points of view neutrally. This might be possible merely through putting oneself into other people's shoes so as to perceive their inner thoughts, thus overcoming egocentricity. This principle also involves the acknowledgement of the likelihood to be deceived despite our strong belief that we are always right. Successful critical thinkers tend to recall the occasions when they are wrong and to stay impartial until perceiving unfamiliar ideas thoroughly (Paul et.al., 1990).

2.4.7. S-4: Exploring thoughts underlying feelings and feelings underlying thoughts

Paul et.al. (1990) stated that unlike the common view, ideas and feelings should not be considered as two independent opposing forces. As a matter of fact, all people's feelings are based on some thoughts and some emotions that create almost all the thoughts of feeling. Critical thinkers are aware that their emotions result from the reaction to a particular situation. They also acknowledge that emotions might be unlike

notwithstanding different perception or interpretation of a situation. They accept the idea that feelings and thoughts are not two separate things but interlinked, whereas uncritical thinkers are not able to recognize the relation between their emotions and thoughts, thereby running away from the responsibility for their own feelings and actions.

2.4.8. S-5: Developing intellectual humility and suspending judgment

Critical thinkers perceive the points of confinement of their insight. They are touchy to conditions in which their local egocentricity is probably going to work self-misleadingly; they are delicate to predisposition, bias, and constraints of their perspectives. Intellectual humility depends on the acknowledgment that one ought not to assert more than one really knows. It does not suggest cowardice or obedience (Paul et.al., 1990).

2.4.9. S-6: Developing intellectual courage

To be able to think critically and independently, a person highly needs to confront and reasonably manage disliked thoughts, convictions or perspectives. The boldness to do as such emerges when we see that thoughts considered unsafe or ludicrous are some of the time reasonably supported (in entire or to some extent) and that conclusions or convictions taught in us are once in a while false or misleading. Basically saying, we should not inactively and uncritically acknowledge what we have learned but should have courage to be open to some new ideas no matter how much they sound absurd or illogical (Paul et al., 1990).

2.4.10. S-7: Developing intellectual good faith or integrity

Critical thinkers perceive the necessity to be consistent with their own ideas, to be predictable in the scholarly measures they apply, to hold themselves to the same definite measures of confirmation and evidence to which they hold others, to apply what they recommend for others, and to genuinely concede disparities and irregularities in their own particular ideas and activities. They accept most emphatically what has been supported by their own ideas and experience. They have a guarantee to bringing the self they are and the self they need to be as one. Individuals by and large are frequently conflicting in their use of models once their sense of self is included decidedly or contrarily. For

example, when individuals like us, we tend to over-gauge their positive qualities; when they loathe us, we have a tendency to underrate them (Paul et al., 1990).

2.4.11. S-11: Comparing analogous situations: transferring insights to new contexts

The more successfully an idea is utilized, the stronger it is. So it can be claimed that stability is the key factor of leading an idea to infertility. Critical thinkers are quite diligent in utilizing the ideas, which enables them to transfer the ideas in a critical manner. They are also capable of adapting their ideas to new situations and putting them into practice. In other words, by comparing the alternative cases, they integrate their ideas into different situations and specifically organize materials and experience accordingly. Accomplished critical thinkers reserve each idea or principle for other situations by keeping them ready and benefit from them via analogies (Paul et al., 1990).

2.4.12. S-13: Clarifying issues, conclusions, or beliefs

Clarity and accuracy are among the universal intellectual standards and might be considered as the backbones of ideal thinking. Precise and accurate ideas are always analyzed and justified successfully. It is highly crucial to know what is essential prior to solving or concluding an issue clearly. Before making a judgment or assumption, the issue is expected to be elaborated exactly. Ideal critical thinkers have the competence to notice problematic claims, concepts and evaluation standards which might pose a great problem beforehand. Thus their judgments or assumptions become more accurate and more precise. They are highly able to distinguish the facts from comments, opinions, judgments or theories (Paul et al., 1990).

2.4.13. S-14: Clarifying and analyzing the meanings of words or phrases

The state of knowing a word or a concept does not necessarily mean that we accurately know what it really means and refers to. More is required to put forward such a claim. What comes first indeed is the fact that independent thinking entails clarity of thinking to an extent. Reasonable thinkers profoundly comprehend ideas and apprehend what sort of approval is required for the justification of a case by applying the correct words or terms. Yet, even an admirable presentation does not guarantee the confirmation of others' comprehension. Because, the capacity of a presenter is directly proportional to others' capacity to understand. Therefore, an individual needs to have the capacity to

present clear cases and to utilize ideas properly. In summary, a critical thinker knows the concept or the word appropriate for any specific situation and uses them in their proper place (Paul et al., 1990).

2.4.14. S-17: Questioning deeply: raising and pursuing root or significant questions

Critical thinkers have the capability of probing a subject or an idea adequately by means of searching for the questions and concepts lying beneath what they are reading. They place the details which they have acquired to the whole properly and form their own integral points of view. They consider the pivotal matters in the background of the subjects or questions they are dealing with; yet, they never digress. They make use of solely the most significant subjects in order to direct their own ideas and never rely on the patterns already generated by others (Paul et al., 1990).

2.4.15. S-19: Generating and assessing solutions

Commonly, individuals cannot find the most proper solution to resolve a problem. This is probably because the matter has not been taken hand yet. Critical problem solvers always do their best so as to find the optimum and the most reliable way to solution. For them, solutions are not independent but interlinked. One of the most distinctive characteristics of critical thinkers is their ability to think creatively to figure out the most possible solution. Even though they produce solutions based on their prior experience, active critical thinkers are flexible and creative as well. Therefore they never avoid experiencing new ideas, and they approach problems realistically with determination to find the optimum solution (Paul et al., 1990).

2.4.16. S-21: Reading critically: clarifying or critiquing texts

Neither do critical thinkers tend to deny a text nor have doubts unless they understand it thoroughly, which never indicates that they do not have any adequate skepticism. Clarity is supposed to occur in their mind prior to coming to a decision. In order to provide this, they carry out reading process by means of checking their comprehension step by step. Critical thinkers do not accept nonsense and absurd ideas; besides, they never have blind confidence in what they read. However while reading, they ask questions and seek the cause and effect relationships, implications and facts. Critical readers do not consider a text as simple organizations consisting of phrases, whereas they

meticulously make comments which are appropriate for the whole text. They certainly know the fact that text writers are likely to make mistakes as every individual. Hence, successful critical thinkers are aware that a book or a text is read with a limited perspective, and other viewpoints should be taken into consideration to acquire more valid knowledge (Paul et al., 1990).

2.4.17. S-22: Listening critically: the art of silent dialogue

Critical thinkers are capable of distinguishing the critical and active listening from others. They well know the fact that words coming out of mouth could easily be misunderstood by the listener. They also acknowledge that it is rather arduous to integrate one's ideas with others'. There is a conspicuous distinction between speaking and listening. Humans convey ideas through alignment of only their own ideas and thoughts. Yet, listening is far from being such simple. While listening, other's opinions are absorbed and converted to ideas which sound logical to us. Average listeners are not able to determine which idea is directing them since they do not possess the point of view, background and experience of the speakers. On the contrary, critical listeners prefer to interpret others' words within the framework of their own experience constantly, and they try to find a way to catch up with speakers' perspectives. As a result, it is crucial to know how to listen critically and actively to manage critical listening (Paul et al., 1990).

2.4.18. S-24: Practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives

Critical thinkers are accomplished questioners, and this is perhaps the most distinctive characteristic of theirs. Their skill of questioning and probing deeply in order to reach root ideas and their determination to discover what lies behind things make them evidently distinctive. They are able to ask great many kinds of questions and develop attitudes according and appropriate to these questions. Critical thinkers have the ability to utilize several questioning techniques. But they never do it so as to humiliate people. Their aim is to find out humans' opinions in details and to help them develop new ideas. Additionally when they encounter a new idea, they tend to understand it and comprehend its implications as well as associating it with their past experience. They are able to discover others' perspectives quite easily. While accomplishing all these, they utilize probing questions. Above all of these, critical thinkers never feel intimidated or under

threat while being asked questions by others, for, they consider questions as good opportunities in terms of developing any idea (Paul et al., 1990).

2.5. Higher Order Thinking Skills and Bloom's Taxonomy

Higher Order Thinking Skills (HOTS from now on) is a very accepted and approved concept in many nations' educational formation. A large number of people in scholarly life consider the concepts of critical thinking and problem solving as the most recent essentials of 21st century learning (Trilling & Fadel, 2009). The exemplary scope of intellectual aptitudes utilized by educationalists was first set out by Benjamin Bloom and his partners in the late 1950's. In it, they shaped what is referred to today as the Taxonomy of Educational Objectives. Bloom's Taxonomy is a characterization framework for instructive objectives which incorporate knowledge, comprehension, application, analysis, synthesis and evaluation stages.

Studies which have been recently conducted on *cognition* have revealed that acquisition of the main content of a course is expected to precede an attempt to utilize it. Using the skills such as critical thinking, problem solving and creativity is accepted to increase learners' motivation as they use knowledge while being learnt. Resnick and Hall (1998) stated that "What we know now is that just as facts do not constitute true knowledge and thinking power, so thinking processes cannot proceed without something to think about". For each subject at any grade, teaching and learning practices must involve dedication to content knowledge, high thinking and active utilization of knowledge (Resnick, 2007). Previously, teachers used to be taught learning sequence according to *Taxonomy for Learning* (Bloom & Krathwohl, 1956), which were *knowledge*, *comprehension*, *application*, *analysis*, *synthesis* and *evaluation*. In the course of time, this taxonomy was overthrown by a great many studies revealing the fact that students do not learn in this way (Silva, 2008). When the taxonomy was revised, the terms were updated to *remember, understand, apply, analyze, evaluate,* and *create.* Moreover, scholars claimed that "these processes can be learned at the same time or even in reverse order" (Anderson & Krathwohl, 2001). What's more, a growing body of research has revealed that learning outcomes can be improved through the combination of these thinking skills.

The taxonomy has undergone some alteration throughout time and has been revised by Anderson and Krathwohl in 2001. There are, of course, some distinctions between the original and revised taxonomy. These can be sorted as they follow:

1- The main focus on the use of taxonomy has changed. While the original taxonomy helps to better evaluate, the revised taxonomy also focuses on the planning, teaching and assessment as well as the consistency among program items.
2- The revised taxonomy is designed for teachers working at school level. The original taxonomy gives more examples of higher education, whereas the revised taxonomy also gives examples in primary and secondary education.
3- The original taxonomy is more focused on multiple-choice tests, but the revised taxonomy includes sample measurement procedures to make the various steps meaningful.
4- While the original taxonomy emphasizes the six main steps, the revised taxonomy focuses more on the lower steps. The main steps are made only determiners.

Unlike the original version, the revised version differentiates the procedures used to solve the problems like “What to know? How to think?”.

Figure 2: Higher Order Thinking Skills
Source: https://cortesfranciscojr.wordpress.com/higher-order-thinking-skills-2

The correct identification of the objectives, the attempt to gain them to the pupils as determined, the guidance to the measures and the use as a set of criteria for evaluation is a necessity to achieve a consistent education program. The taxonomies discovered in the 1950-60s in terms of facilitating and guiding the setting of the targets have attracted attention all over the world and have become an indispensable tool despite the various criticisms. The Cognitive Domain Taxonomy (1956), especially prepared by Bloom et al., has been translated into 22 languages in the world since its publication many years ago.

It is highly accepted that HOTs should be gained at school setting which is considered the most appropriate environment. Cotton (1991) points out the fact that schools are supposed to provide students with thinking and problem solving abilities as well as rationales leading them to determination and comprehension of other perspectives of several reasoning (p. 2). Accordingly, Pogrow (2005) stated that HOTs are given importance and are highly credited in that they are considered to develop students' skills to cope with adult's life challenges and hardships of academic world. Educating higher order thinking furnishes students with significant fundamental abilities and offers them an additional advantage of helping them enhance their content knowledge, lower order thinking and self-confidence (DeVries & Kohlberg, 1987; McDavitt, 1994; Son & VanSickle, 1993).

2.6. Costa's Habits of Mind and Paul's Elements of Reasoning

Arthur L. Costa is emeritus professor of education at California State University, Sacramento, and the cofounder of the Institute for Intelligent Behavior in El Dorado Hills, California. Art Costa has devoted his career to improving education through more thought – full instruction and assessment. Through his writings, courses and workshops, Art Costa has been a leader in thinking, mindful instruction and coaching for teachers and administrators for many years. He is co-founder of the Institute for Habits of Mind (cited from https://thesystemsthinker.com/author/arthur-l-costa/).

Richard W. Paul was a philosopher and an international authority on critical thinking. Since the early 1980's, he worked to advance the concept of fair-minded critical thinking through his work at the Centre and Foundation for Critical Thinking, both of which he founded. In developing his understanding of the elements of reasoning, Paul was influenced by his background as a philosopher. But in formulating these elements,

he was influenced by other domains of thought, as well as by educated usages of words (cited from http://www.criticalthinking.org/pages/richard-paul-memorial/1231).

2.6.1. Costa's Habits of Mind

These habits are patterns which are skillfully and carefully utilized by distinctively keen and successful individuals when they encounter problems, the answers to which are not clear. Using these habits requires a number of skills, past experiences and dispositions. With every choice, we prefer a pattern of thinking but we might not choose which is the most appropriate for the occasion. It includes affectability to the logical prompts indicating that it is a proper time and condition to utilize the most appropriate pattern. It is crucial to own the essential skills to fulfill the behaviors effectively and precisely. As a result, using these habits make us consider, assess and evaluate, alter and finally convey our present knowledge to future occasions.

Though more can be taken into account, 16 attributes of active problem solvers have been obtained from the research of viable problem solvers from many strolls of life (Costa and Kallick, 2009). Habits of mind focus on *value, inclination, sensitivity, capability* and *commitment*.

The list of Habits of Mind appears below:

1. *Persisting:* Effective individuals stick to work till they are done with it. They don't easily give up on the task.
2. *Managing impulsivity:* Effective problem solvers aren't triggered intrinsically and they think before they take action.
3. *Listening with understanding and empathy:* Profoundly successful individuals invest an extreme measure of time and vitality listening (Covey, 1989). It is believed by some psychologists that the capability to listen to others and to empathize with them is one of the strongest characteristics of the smart action.
4. *Thinking flexibly:* Flexible individuals have the ability to control themselves the best. They are able to change their mind when they acquire more external information, which makes them successful.
5. *Thinking about thinking (metacognition):* Plato said "When the mind is thinking, it is talking to itself". It is very essential for human beings to know

what they know and don't know. As anonymously said, it is a kind of *art of thinking*.

6. *Striving for accuracy:* Those appreciating precision, accuracy and expertise allocate time to check their final work. They observe the necessary rules and criteria which they have to follow and make sure their final work complies with the criteria precisely.
7. *Questioning and posing problems:* Successful problem solvers know the way to ask questions according to the occasions and to pose problems from different perspectives. They never show a fix-minded approach.
8. *Applying past knowledge to new situations:* Experience is very significant for individuals to shape their future lives in that learning from experience means not to make the same mistake again (Einstein). For that reason, conveying the past skills and knowledge to future, we can construct behavior patterns for new situations.
9. *Thinking and communicating with clarity and precision:* Language is of a crucial role in upgrading our psychological patterns. Complex and precise language patterns lead to effective thinking.
10. *Gathering data through all senses:* Information is sucked up by our brains via sensory organs. Most learning takes place through these senses. However, the recent scientific findings suggest that the more senses are utilized while acquiring information the better and the more permanent the learning will become.
11. *Creating, imagining and innovating:* Every new thing begins with an imagination. Creative people are capable of approaching any kind of problems from different angles, and thereby solving them in different ways. Besides, they are always open to new ideas and willing to find new ways to conceive solutions using an innovative approach.
12. *Responding with wonderment and awe:* Successful people do their job not only with a sense of capability but also with a sense of enjoyment. They take pleasure of finding and solving new problems and presenting them to other people.
13. *Taking responsible risks:* Only the risk takers can go beyond the limits as Atkinson states: "There has been a calculated risk in every stage of American development--the pioneers who were not afraid of the wilderness,

businessmen who were not afraid of failure, dreamers who were not afraid of action".

14. *Finding humor:* Humorous individuals can recognize the situations from a genuine and distinguished point. They value the sense of humor more than any other figures of communication, and therefore they are able to find absurdities and paradoxes of life better.
15. *Thinking interdependently:* Human beings tend to live in communities in which they can socially interact with others, which leads to fruitfulness and assistance among the members of the society. Solitude mostly is accompanied with the sense of loneliness that might cause a feeling of ineffectiveness in an individual.
16. *Remaining open to continuous learning:* As Einstein stated "The important thing is not to stop questioning since curiosity has its own reason for existing". Curiosity brings intelligence and intelligence brings confidence, which lets individuals search for more.

When we consider Costa's 16 habits of mind as a whole, it might be claimed that all of them are important and relevant to critical thinking characteristics.

2.6.2. Paul's Elements of Reasoning

Critical thinking is the capacity to be responsible for one's reasoning. It incorporates the capacity to deliberately look at the components of one's thinking, or that of another, and assess that thinking against all inclusive scholarly guidelines - clearness, exactness, accuracy, significance, profundity, broadness, and rationale. It additionally includes the organized examination of wellsprings of data. Paul's elements of reasoning are as they follow:

1. *All reasoning has a purpose:* Reasoning requires purposefulness and one's purposes should clearly be different from other irrelevant objectives. Unrealistic and insignificant purposes can deflect the individual from the target.
2. *All reasoning is an attempt to figure something out, to settle some question, to solve some problem:* So as to figure something out, it is essential to create

questions relevant to the issue and describe those questions to draw a clear picture of the phenomenon by dividing the questions into sub categories.

3. *All reasoning is based on assumptions:* Reasoning involves distinguishing the presumptions clearly and determining if they are legitimate by considering how the presumptions are molding one's perspective.
4. *All reasoning is done from some point of view:* For good reasoning, it is crucial to identify one's point of view clearly and criticize it fairly to see its pros and cons.
5. *All reasoning is based on data, information and evidence:* Reasoning should be supported by the valid data which is definite, precise and related to the problem at hand. Additionally, opposing ideas and information should be sought to empower one's claims.
6. *All reasoning is expressed through, and shaped by, concepts and ideas:* Reasoning requires recognizing key ideas and clarifying them obviously in addition to making sure ideas are utilized with care and accuracy.
7. *All reasoning contains inferences or interpretations by which we draw conclusions and give meaning to data:* For good reasoning, inference should be made solely according to true implications of data by means of verifying whether inferences are consistent with one another.
8. *All reasoning leads somewhere or has implications and consequences:* Reasoning should be followed by implications or conclusions which arise from the reasoning. Besides, the implications might have both positive and negative aspects. All possible consequences should be considered.

Although all the elements above relate to characteristics of critical thinking skills and abilities in general, Costa's "T*hinking about thinking (metacognition)"* habit and Paul's "*All reasoning is an attempt to figure something out, to settle some question, to solve some problem"* elements are directly relevant to characteristics of critical thinkers. Efficacious critical thinkers are aware of what and how they think, and thereby having metacognitive skills. Besides, they have the ability to pose questions for certain situations in order to have a better understanding of issues they encounter. As a result, problem solving skills and metacognition are two most distinguished characteristics of critical thinkers among the elements mentioned above.

2.7. Metacognition

In online Oxford dictionary, metacognition is described as *"awareness and understanding of one's own thought processes"* or it can simply be identified as "thinking about thinking". In a research on children's forward memories in 1976, Flavell first used the term *metamemory* and introduced the term to the literature. Developing his research in 1979, Flavell reconstructed his theory including *metacognition*. Metacognition, with the shortest definition, means one's being aware of his/her cognitive processes and taking control of these processes (Flavell, 1979; Wellman, 1985; Hacker & Dunlosky, 2003; Jager et al., 2005). For Reeve and Brown (1985), metacognition is the adequacy of individuals' ability to control and to manage their cognitive processes. On the other hand, Sternberg (1988) defined metacognition as a high-leveled managerial process in which an individual utilizes planning, monitoring and assessment to solve a problem. Butterfield et al. (1996) described the term as recognition of the factors affecting cognition and controlling cognition accompanied with small models by monitoring. What distinguishes metacognition from cognition is the fact that metacognition requires awareness and proper use of cognition (Brown, 1980). While cognitive teaching features acquiring strategies specific to situations, metacognitive teaching focuses on teaching the skills of monitoring and controlling this process (Loper, 1982). Ülgen (2004) suggests that teaching metacognition is based on the assumption that once individuals understand how their cognitive processes function, they will be able to supervise and use the processes much more effectively by means of regulating them appropriately (p. 64). Affirming this assumption, a growing body of research has concluded that metacognition has a significant role in education of children and adults (Kapa, 2001; Kramarski, Mevarech & Arami, 2002; Marge, 2001; Mevarech, 1999; Schoenfeld, 1985; Teong, 2003). Besides, it has been suggested that there is a positive correlation between the achievement level and metacognitive skills (Case, Harris & Graham., 1992; Desoete & Roeyers, 2002). Studies revealing the relation between metacognition and academic achievement have subsequently led to experimental research on fostering achievement through teaching metacognition. As a result of the research carried out for this purpose, it has been found out that there are positive and significant increases in the success levels of the children who were applied teaching processes to develop metacognitive skills (Çakıroğlu, 2007b; McDougall & Brady, 1998; Naglieri & Johnson, 2000; Teong, 2003).

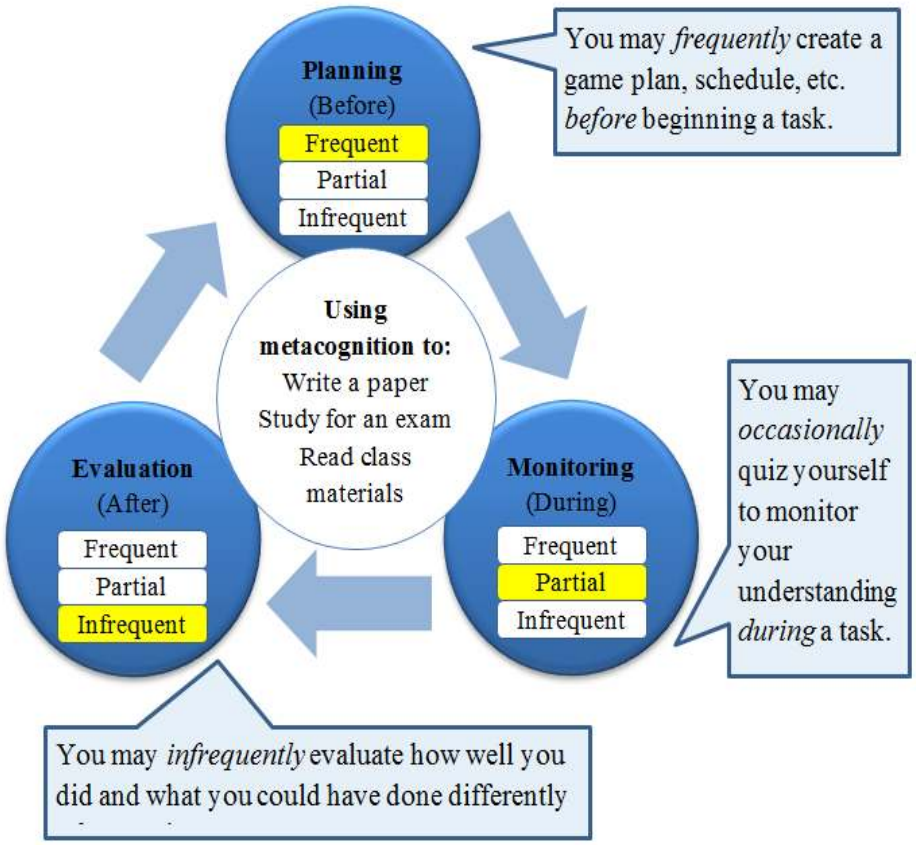

Figure 3: Processes of metacognition
Source: http://srl.daacs.net/metacognition.html

Metacognition involves the processes of planning, monitoring and evaluation as well as using the right strategy in the best way and right time (Brown, 2004). For Ormrod (1990), a student with these skills is expected to exhibit the behaviors below:

- Being aware of the process of self-learning, memory and which learning tasks are supposed to be completed.
- Recognizing which learning strategies are effective and which are not.
- Planning a proper approach for a specific task encountered.
- Using the learning strategies efficiently.
- Monitoring the current learning situation.
- Knowing whether knowledge is learnt or not.
- Using effective methods for recalling previously stored information.

2.8. CT Skills into Language Instruction

A great many studies have revealed that enhancing CTS in language instruction is of a pivotal role for some definite reasons. Primarily, language learners will be able to plan, monitor and evaluate their own learning styles a lot better when they are responsible for their own learning and thinking. Additionally, critical thinking is most likely to widen language learners' horizon, thereby expanding their learning experience as well as giving specific meaning to language. Moreover, it has been suggested several times that CT has a positive correlation with students' success (Rafi, 2011). Distinctive studies have affirmed so far that CT has a significant role in enhancing writing skills (Rafi, 2011), language competency (Liaw, 2007) and oral communication skills (Kusaka & Robertson, 2006). When given motivation and taught to exhibit CTS appropriately, students can become competent language users, which clearly indicates that students should reflect on their ideas and support them with logically produced arguments (Rafi, 2011).

A great deal of research in the field has largely suggested that improving language skills is highly related, and teaching HOTs are expected to be a constituent part of EFL curricula (Chamot, 1995; Tarvin & AlArishi, 1991). Instructors and researchers all over the world have accentuated the significance of fostering CTS in language classrooms and experimental findings support the adequacy of teaching CTS while teaching English as a foreign language (Chapple & Curtis, 2000; Davidson, 1995). As a result of several empirical studies, it has been found out that students developing CTS are able to perform language tasks and do activities much better than the others without CTS. In their experimental study, Mahyuddin et al. (2004) have got the results indicating that students with CTS can think critically and fruitfully so as to accomplish the curricular goals; can reach true decisions and solve problems more easily; can use their thinking abilities; can understand contents of language better and can become balanced in physical, emotional, intellectual and spiritual ways. However, although there are naturally some arguments against the significance of teaching and utilizing thinking abilities in language development, learning a foreign language and CTS is frequently considered as individual processes (Mirman & Tishman, 1988; Suhor, 1984). Supporting this idea, Li (2011) and Pica (2000) point out that in conventional methodology of English instruction, integrating thinking skills into language teaching is peripheral. A number of researchers like Kabilan (2000) claim that language instruction based on a communicative approach, which stresses the utilization of language as a tool to communicate, is not sufficient for students

to become expert with the language they learn. They suggest that language learners need to be capable of thinking critically and creatively so as to be proficient users of the language. Thus we can conclude that developing critical thinking skills requires much more than traditional language teaching approaches. As Brown (2004) states, traditional curricular objectives are supposed to go beyond typical linguistic elements in order to promote CTS in language learners. As a matter of fact, language instruction is expected to be designed for not only to teach the essentials of the language which is being learnt but to broaden learners' horizon with relevant facts as well (Widdowson, 1990, p. 54).

The role of language instructors is very crucial in teaching a foreign language into which CTS are infused. Critical thinking education does not consist of merely teaching CT strategies but requires a lot more. Learners are expected to transfer the knowledge they acquire into practice. Boyles (2002) clarifies this situation as "without modeling or guided practice, teachers have no idea whether or not students understand the lesson content until it is too late" (p. 21). Likewise Lai (2010) proposes that teachers ought to provide their students with plenty of occasions to practice and suggests that teachers are required to stimulate students for active participation in group work (p. 25). Lai also states that "educators should model critical thinking in their own instruction by making their reasoning visible to students" (p. 36). Modeling implies that the instructor participates in the learning process precisely as learners will be relied upon to perform it. Lipman (2003) concludes that instructors have the responsibility for promoting CTS in their students rather than assisting them from lower instructional level to the higher. As a result, it can be clarified that language instructors should help their students learn CTS while learning a foreign language. It can be asserted that infusing critical thinking skills into English curriculum is of great value for future research.

2.9. Infusion Model

It is greatly accepted that generally and typically, language instructors become content when their students acquire some knowledge containing basic skills as well as grammar, words and other linguistic constructions. This is widely carried out through a traditional approach called PPP or Presentation – Practice – Production. Nevertheless, it is rather insufficient for a purpose of bringing students in critical thinking skills. Teachers are supposed to employ a more inquisitive learning mode supported by interactive activities focusing on several subjects which can appeal to students. This might be

possible by depending on students' past experience by means of asking clear and accurate questions in order to draw a clear picture of what is in their mind. Thus it might become possible to engage language usage in critical thinking skills (Vdovina & Gaibisso, 2013).

In infusion model, multiple thinking abilities are given to students across a number of curricula, which clearly indicates that content knowledge and thinking abilities can be taught together (Swartz & Parks, 1994). This approach targets to insert the CT education in all subjects so that thinking abilities can become involved in all parts of students' academic life (Dewey & Bento, 2009). The main target of infusion approach is to foster students' capability of knowing and using basic thinking patterns and to provide them with the ability to make connections between curriculum content and thinking (McGuinness & Sheehy, 2008). Despite the fact that CT dispositions underneath infusion model are still being discussed by many, it is already accepted and introduced as a specific approach owing to its significance and consideration of thinking in terms of emotions and motivation (Swartz & Parks, 1994; Swartz, 2004). Bensley et al. (2010) mentioned a direct infusion model which associates active teaching with other components that have been found so far. These components involve teaching the elements of CT explicitly, guided instruction (Mayer, 2004), direct instruction and feedback derived from formative assessments (Black & William, 1998) with the utilization of infusion which aims to teach students the ways to think critically. Abrami et al. (2008) obtained some results indicating the effectiveness of the explicit teaching of critical thinking principles separately and subsequently infusing them into curriculum content. CT principles are explicitly taught with examples in direct infusion and their use is promoted with exercises inside the content instruction supported by formative assessments which require the dispositions of CT principles and rules.

2.10. Studies on Teaching CT Skills

Unfortunately, there are not plenty of studies conducted to infuse critical thinking skills into English curriculum at high school level. Yet, some specific studies on teaching CTS are going to be mentioned.

Chen (2017) conducted a case study on integrating thinking skills into second language (L2) learning and its effects on learning process at a high school. As a result of the analyzed data, it was observed that three-quarters of students embraced the procedure positively and were content with learning HOTs. It was also found out that the students'

performance and attitudes of learning was facilitated by the new learning form. Additionally, the students made progress in speaking L2 and reflecting what they learnt. The study suggests definite recommendations for language instructors who aim to promote CTS in their L2 classroom, and indicates that thinking tasks provide ample opportunities for students in their adaptation to the thinking approach.

In an evaluative exploratory study, Lin (2014) sought answers to the question whether CT infusion into L2 classroom was applicable and contributive as a method at a high school. In this study, the researcher compared the development of two classes, to one of which CT infusion was applied. Data obtained from pre and post intervention stages indicated that students who were exposed to CT infusion exhibited observable improvement in the target language. Besides, they benefited the occasions to put CT into practice in their writing. The students also exhibited positive approach towards the classes and CT tasks. The study reveals that CTS can be implemented into L2 classes through infusion model and has a number of positive effects on developing thinking and language skills.

Kow (2016) conducted a multiple case study seeking to form an explanatory theory on CT infusion. In this study, grounded theory methods were used and the data analyzed accordingly. As a result of multiple data collection and analyze, it was observed that there was enough evidence to put forward an explanatory theory which supports the efficient CT infusion by expert teachers who are capable of teaching CTS through infusion. The researcher concludes that the holistic infusion of CT in every program has created a critical thinking culture in school.

In an quasi – experimental study, Alighieri and Ismail (2014) searched for the potential effects of creative and critical thinking integration on primary students' thinking skills. As a result of the analysis of quantitative data, it was found out that thinking strategy tasks made a significant difference in the test group compared to the control group. Besides, they assert that participants of thinking skills group that faced a new learning environment were able to concentrate on the new idea more than the others. The research also revealed that thinking – based teaching strategy had the potential to raise students' creativity and learning levels to an extent.

Sazant (2014) conducted a study on primary level to promote learners' engagement in lessons by means of a critical thinking framework. The results of the data obtained from interviews indicated that critical thinking positively affected the engagement levels of both students and teachers; critical thinking had a significant effect

on student success and developing HOTs; efficient strategies were mostly beneficial to promote critical thinking; some challenges might occur during implementation of critical thinking and the support to a certain extend was needed to accomplish teaching critical thinking.

In a study conducted at a junior high school, Liaw (2007) sought the answer to the questions whether students might gain critical thinking skills through a content – based teaching and the possible effects of this EFL instruction targeting to foster critical thinking skills. The findings of pre and post critical thinking tests showed no significant difference following the procedure. However, the students were observed exhibit critical thinking dispositions in six cognitive domains classified by Bloom (1956). The researcher concludes that it can be inferred out of students' engagement in reading and writing activities revealed critical thinking dispositions.

Petek and Bedir (2015) conducted research to raise the critical thinking awareness of ELT students in language instruction. In this mixed – designed study, critical thinking tasks and questionnaires were given to the prospective teachers. The results from the data indicated that the participants exhibited a cognitive development in perceiving critical thinking and the infusion of critical thinking skills into EFL classroom. As a result of the study, it was concluded that the prospective language instructors benefitted from the critical thinking training and their awareness evidently increased.

In the light of these recent and other previous studies, it can be assumed that critical thinking skills can be taught to students in L2 classrooms through an infusion model. Even though a proper infusion supported with explicit instruction applied with tasks, modeling and other essential components seem to suffice, the role of expert and competent teachers who are able and willing to provide students with critical thinking cannot be denied. As a result, this study is believed to contribute to the related literature and to have research value and implications for prospective studies.

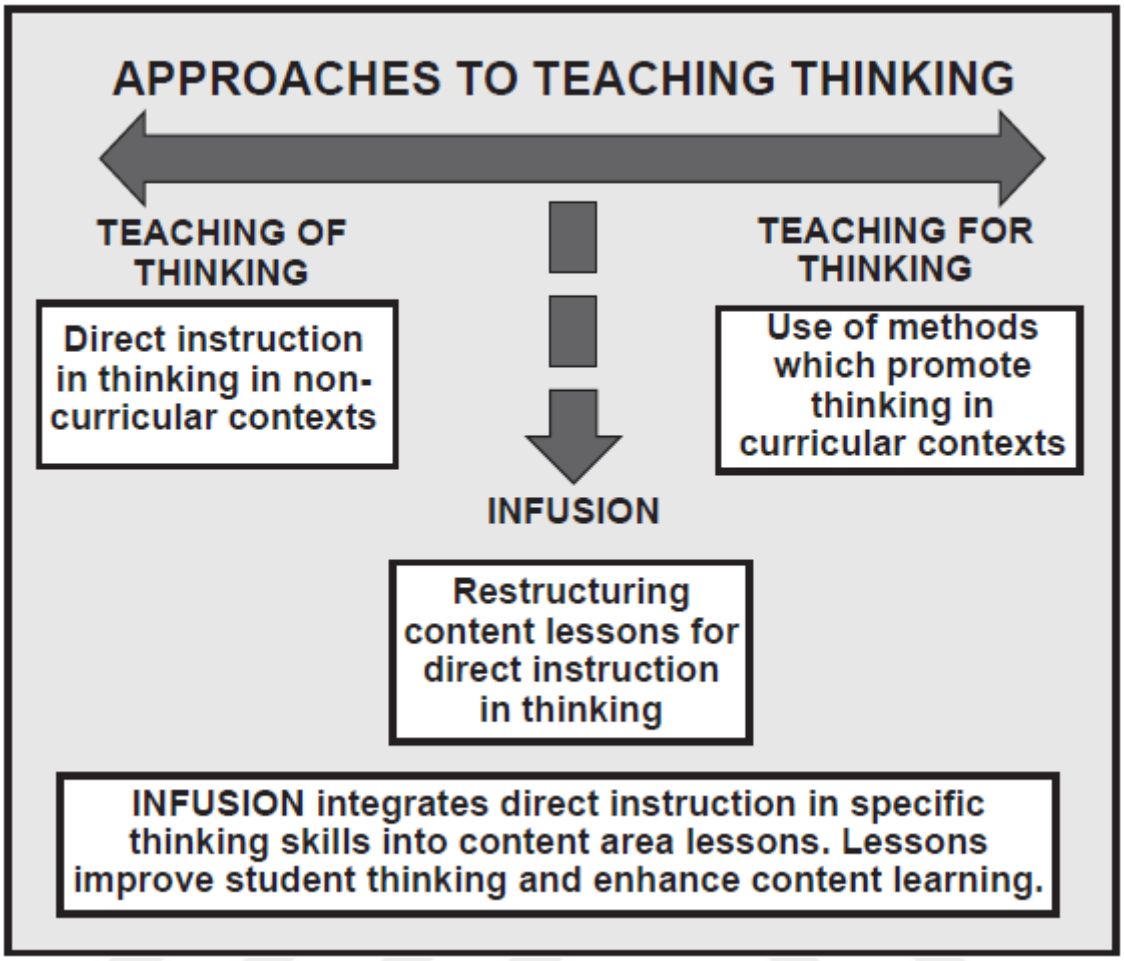

Figure 4: Approaches to Teaching Skills

Source: 1998 Critical Thinking Books & Software – www.criticalthinking.org

As Swarts and Parks (1994) stated, incorporating critical and creative thinking into content teaching brings together the features of two opposing instructional approaches to teach the trainers to think what they are doing: (1) instruction in direct thinking in the context of the curriculum, and (2) the use of methods that encourage thinking in content lessons. Infusion lessons are similar to, but incompatible with, both types of teaching. The diagram in Figure 4. represents this triplet. The teaching of thought through direct instruction means within a certain period of time for the instruction of thinking. Infusion lessons are not taught in separate lessons or programs outside the regular curriculum. In infusion lessons, direct teaching content is interfered with thinking.

They categorized the processes in infusion lessons as they follow:

THINKING SKILLS

I. Skills at Generating Ideas

1. Generating Possibilities

• Multiplicity of Ideas

• Varied Ideas

• New Ideas

• Detailed Ideas

2. Creating Metaphors

A. Analogy/Metaphor

II. Skills at Clarifying Ideas

1. Analyzing Ideas

A. Compare/Contrast

B. Classification/Definition

C. Parts/Whole

D. Sequencing

2. Analyzing Arguments

A. Finding Reasons/Conclusions

B. Uncovering Assumptions

III. Skills at Assessing the Reasonableness of Ideas

1. Assessing Basic Information

A. Accuracy of Observation

B. Reliability of Sources

2. Inference

A. Use of Evidence

a. Causal Explanation

b. Prediction

c. Generalization

d. Reasoning by Analogy

B. Deduction

a. Conditional Reasoning (if ... then)

THINKING PROCESSES

I. Goal Oriented Processes

A. Decision Making

B. Problem Solving

CHAPTER III

METHODOLOGY

3.1. Introduction

This chapter contains the participants, data collection tools, the data collection procedure, data analysis and the procedure. This study deals with the issue of whether a group of high school students at Emine Nabi Menemencioğlu Anatolian High School can be benefited from Critical Thinking Skills instruction through infusion model in English classes.

3.2. Research Design

This study was conducted on the basis of *Sequential Explanatory Design* in accordance with mixed method principles (Creswell et al, 2003), in which the development and reflections of a particular group were observed both qualitatively and quantitatively. Data was also gathered in two phases: Firstly the quantitative data and the qualitative data to support the findings. Participants were given CT tasks regularly in English classes through remodeled unit plans, which were prepared according to CT principles. Pre and post questionnaires were used to gather quantitative data and face-to-face interviews were used to obtain qualitative data. The study was longitudinal covering a full educational year, 2017 – 2018; and the data was collected for a year with the aim of comparing the change in students' development of critical thinking abilities.

Nonetheless, an experimental design might have been preferred and suited better to see the level of development of target group; but a design in which there was no control group and the whole population was to be observed comparatively and progressively from beginning to the end was opted. Qualitative and quantitative research in social sciences has recently developed largely and become popular among researchers. This popularity is on the grounds that research procedure keeps on advancing and evolving, and mixed methods is another progression forward, using the advantages of both qualitative and quantitative research (Creswell, 2009).

3.3. Participants

The research involved four 10th grade classes (131 students) in Emine Nabi Menemencioğlu Anatolian High School in central Adana. The school is in the center of the city, and it accepts students according to the results of a central examination (TEOG). There was no particular sampling among the students, and all of them were spontaneously involved in the research process; however a convenience sampling could be mentioned in this study since the researcher was still teaching all the classes, thereby solving the problem of accessibility (Frankel & Wallen, 1993).

The ages of participants were between the ages 15 and 16 and none of them was exposed to CTS course before. The participants had been taking four English classes in a week when the study was conducted. Their academic, socio-cultural and socio-economic levels were close to one another, which indicates they formed a homogenous group.

3.4. Data Collection Tools

Quantitative data was collected through a pre – infusion questionnaire consisting of 45 items which represent 35 CT strategies (see Appendix 1) adapted by Bedir (2016) prior to the infusion process. The detailed questionnaire containing the strategies of critical thinking (taken from www.criticalthinking.org) was conducted so as to determine the students' awareness of CT strategies. The data was statistically analyzed via SPSS 21.0. Considering the results of the pre – questionnaire, the strategies with low mean scores were taken out and included in the infusion procedure.

At the end of the CT teaching process, a post – infusion questionnaire (see Appendix 1) prepared by Bedir (2016) was conducted to find out whether or not the CT infusion supported by remodeled lesson plans and CT tasks contributed to the participants' thinking dispositions. However, the questionnaire was reduced to 23 items according to the target strategies. The four likert scale was used preparing the questionnaire and the ranges were *Never = 1, Sometimes = 2, Usually = 3 and Always = 4.* The strategies also were divided into three sections as *Affective Strategies, Macro Abilities* and *Micro Abilities.*

Another data gathering instrument was face – to – face structured interviews. The interviewees (n: 65) were determined via voluntary response sampling. Interviews were structured including open-ended and closed (yes-no) questions in mother tongue in order that the participants could state their opinions comfortably. The interviews were also

audio-taped and transcribed. Qualitative data collected from face-to-face interviews was compiled and analyzed using thematic analysis (Merriam, 2009). The themes drawn out from the analysis were also examined by a board of experts consisting of two lecturers to provide inter-rater reliability. As a result, data credibility was checked through a review of the themes by the *participants as member checking* and they confirmed the summaries reflected their views and feelings. Following questions were directed to the interviewees:

1. Would you like to be directed by others?
2. Do you always make your own decisions or others make it on behalf of you?
3. Supposed that you argued with your best friend and that your friendship has broken down hence. Would you consider your behavior and criticize yourself even if you were right?
4. Supposing your teacher expressed that she/he was uncomfortable with one of your behaviors and asked you not to exhibit it any longer. Yet, you were not agree with your teacher. What kind of behavior would you exhibit?
5. Do you consider the knowledge you acquire from a book as absolutely right? If not, how do you acquire knowledge?
6. Supposed that you were facing a difficult situation and that you must make a decision immediately. How would you act?
7. How do you behave when you solve the problems you encounter?
8. How do you think having "Critical Thinking" skills affect your life?
9. How did you perceive the critical thinking tasks?
10. Do you think Critical Thinking should be taught at schools? Why or why not?

3.5. Procedure

The study included four 10^{th} grade classrooms with 131 students to all of whom the researcher was teaching English four hours a week. The researcher let the school management know about the study he was going to conduct beforehand in that distinct tasks and information would be used in English classes. Then the students and families were informed and consent forms were signed by the families (see Appendix 3). Ethical considerations were specified according to the principles of ethical considerations of Bell and Bryman (2007).

At the beginning of the infusion process, the students were given a questionnaire with 45 items which represent 35 CT strategies. After the results were obtained, the items with low mean scores were explored and taken out of the questionnaire. The number of these items which were compiled after the reduction became 23. The strategies which these 23 items represented were focused in the infusion process and the students were taught these strategies explicitly.

The tasks were chosen taking the curricular goals into consideration according to the language content determined by the Ministry of Education. The study lasted a whole educational year and during this period, the participants were informed about CT strategies, CT skills and CT dispositions by means of direct presentation. Remodeled lesson plans (see Appendix 4) and tasks (see Appendix 5), prepared by getting assistance from a scholar and his research (see acknowledgements), were used to promote CT skills of the participants while learning English. While preparing the lesson plans, Numrich's sequence of CT tasks was based upon (see Table 1). During classes, such teaching techniques as *Socratic Questioning, Metacognitive Approach* and *Scenario Analysis* were used. In addition to lesson plans, several activities to foster CT skills were given to the participants as assignments.

Table 1.

Numrich's Sequence of Critical Thinking Tasks (Beaumont, 2010)

Perspective	Critical Thinking Tasks	Skills Practiced
Focus on the students' world	1. Observing	Looking Listening
	2. Identifying assumptions	Sharing background Expressing opinions Clarifying values
Focus on the text	3. Understanding and organizing	Summarizing Distinguishing relevant details Ordering Classifying Comparing and contrasting Explaining cause and effect
	4. Interpreting	Making inferences Interpreting meaning Hypothesizing Theorizing
Focus beyond the text	5. Inquiring further	Surveying the public Interviewing a specialist Researching
	6. Analyzing and evaluating	Synthesizing information Critiquing Reflecting on related ideas Making logical conclusions Reevaluating assumptions
	7. Making decisions	Proposing solutions Problem solving Taking action Participating

Numrich's sequence of CT tasks contains observing, identifying assumptions, understanding and organizing, interpreting, inquiring further, analyzing and evaluating and making decisions phases.

At "*Observing*" stage, the main target was to have the students prepared for more tasks ahead with initial tasks and to give the participants to analyze the main subject prior to initiation. The tasks were used as an introduction to lexical and grammatical content. As Beamount (2010) states that even though this phase can be considered irrelevant to CT, it actually provides a constitutional level of analysis (p. 8). This stage substantially enables students to stimulate their background lexical and grammatical knowledge. Therefore, they were directed specific questions having them look, listen, notice and name the task figures.

"*Identifying Assumptions*" stage also featured as a pre-activity the aim of which was to ask for the students' assumptions based on their experience about the things they see or listen to. Beamount (2010) describes this stage as "Identifying assumptions is a chance for students to share their backgrounds, express opinions, and clarify their current thinking or values on topic' (p. 10). Once the students represented their assumptions as a pre-task activity, they were made to remark their impressions having gone through the text in detail. This activity served as an opportunity to stimulate their schemata, to utilize their imagination and the most significantly to think critically. During this stage, a variety of probing questions were directed to the students.

"*Understanding and Organizing*" stage requires full attention and focus on the text. During the activities, students were asked for what they comprehended from what they read via questions for check. This is very crucial to make progress in CT since it reveals what is understood from the text. Having completed the initial stages, they were presumed to be prepared to deal with the main part. At first, some questions the answers of which could be easily found in the text were asked to the students. The questions varied in terms of formation such as comparing, classifying, categorizing and organizing information. Beamount (2010) suggests the idea that effectual CT can never be actualized without an awareness and concrete attribution to the facts.

At "*Interpreting*" stage, students were made to concentrate on the text, thereby drawing inferences as well as they could. They were supposed to infer and interpret meaning, and cogitate from the things which they read, saw or heard. They needed to make use of the information they acquired to the maximum in order that they could comment and focus on the meaning behind the lines. The students were also provided scaffolding to some extent by being given examples to enable them to go deeper in meaning. Probably the most crucial part of these activities was the justification the students had to put forward for their opinions about what they were dealing with. As a matter of fact, to justify one's opinions with sound evidence can be considered as a pivotal element of CT in that this requires effective thinking.

As Beamount (2010) proposed, at "*Inquiring Further*" stage students were supposed to discover more information or new comprehension from the subject they were examining. Utilizing the whole information and all the inferences priorly obtained, they managed to probe the text to a great degree. Thanks to inquiring further, students take the information from the text and incorporate with their previous assumptions and inferences, thereby digging out more (Beamount, 2010). In this study, the students carried out the

inquiring further phase by means of surveying, interviewing and library or internet research. It is a fact that all these tasks might necessitate some instruction or counseling.

"*Analyzing and Evaluating*" stage requires more individual effort since students are supposed to find a text similar to the previous one and establish a connection between them. It is believed that such extra texts enable students to probe the topics a lot better and to explore different perspectives. In this study, most of the students were able to find secondary texts with almost the same content as the previous text. In such cases, they received guidance as to where and how they should do research on the topic on hand. Dialogues, paragraph comparison, asking more specific questions were the activities used during tasks.

"*Making Decisions*" stage was considerably the most challenging part of the procedure due to the fact that students needed to use their CT skills to generate solutions and make decisions based on their own experience. By means of grounding what they acquired from prior activities, they strived to draw conclusions and make decisions of their own. It naturally took time for the students to be able to make their own decisions owing to their limited experience in life. Their age level can be considered another factor hindering them from exhibiting CT dispositions adequately. However, most of the students were able to draw conclusions and make decisions through inferences when they were given situations. On account of classroom limitations, some of these tasks were given as assignments.

CHAPTER IV

DATA ANALYSIS

4.1. Introduction

The purpose of the study was to discover whether or not CT infusion into EFL classes would enable high school students to develop CTS through remodeled lesson plans and tasks. In the light of this purpose, unit plans were prepared so as to infuse CTS into English classes. Obtaining the data, pre – infusion questionnaire, post – infusion questionnaire and structured face – to – face interviews were conducted. The following section presents the findings derived from the data collection via questionnaires and interviews.

4.2. Analysis of The Quantitative and Qualitative Data

The data gathered from Critical Thinking Questionnaire conducted both at the beginning and the end of the study was analyzed quantitatively via SPSS 21.0. Analyzing the qualitative data obtained from face – to – face interviews was analyzed via Thematic Analysis (Merriam, 2009), and the excerpts given were translated into L2 by the researcher and checked by two other scholars for proof checking.

4.2.1. Analysis of the Pre – Infusion Questionnaire

The participants were given a Critical Thinking Questionnaire to see to what extent they were aware of CT strategies prior to the infusion procedure. The questionnaire, adapted by Bedir (2016), consisted of 45 items representing the Thinking Strategies of 35 Dimensions of CT Thought (June, 16, 2013 www.criticalthinking.org). These dimensions were categorized into three sections: Affective Strategies (13 items), Macro Abilities (21 items) and Micro Abilities (11 items). The likert scale consisted of four points: 1 = Never, 2 = Sometimes, 3 = Usually and 4 = Always.

Having analysed the data obtained from the questionnaire items, some certain strategies with low mean values were found out (n: 23). Accordingly, the target strategies were determined and the procedure was shaped in line with the results. Thorough analysis of pre questionnaire presented in Table 2 demonstrates the participants' awareness level of critical thinking strategies.

Table 2.

One Sample Statistics of Pre Questionnaire

	N	Mean	Std. Deviation	Std. Error Mean
Item 1	131	2,3893	,54874	,04794
Item 2	131	2,2443	,69162	,06043
Item 3	131	1,8931	,62329	,05446
Item 4	131	2,1679	,74578	,06516
Item 5	131	2,1069	,55818	,04877
Item 6	131	2,2977	,75135	,06565
Item 7	131	1,9771	,62592	,05469
Item 8	131	2,1069	,61082	,05337
Item 9	131	2,2824	,64777	,05660
Item 10	131	2,2672	,73196	,06395
Item 11	131	2,2443	,77551	,06776
Item 12	131	2,1756	,63828	,05577
Item 13	131	2,0916	,66159	,05780
Item 14	131	1,8397	,63022	,05506
Item 15	131	2,1603	,50865	,04444
Item 16	131	2,0000	,66795	,05836
Item 17	131	2,1221	,56871	,04969
Item 18	131	2,2443	,56964	,04977
Item 19	131	2,2443	,62131	,05428
Item 20	131	1,9695	,67867	,05930
Item 21	131	2,3130	,69153	,06042
Item 22	131	2,0763	,65184	,05695
Item 23	131	2,1908	,66926	,05847
Item 24	131	2,2137	,64459	,05632
Item 25	131	1,8397	,64231	,05612
Item 26	131	2,0153	,64432	,05629
Item 27	131	2,3740	,62433	,05455
Item 28	131	2,5267	,70524	,06162
Item 29	131	2,0687	,62254	,05439
Item 30	131	2,0458	,71104	,06212
Item 31	131	2,4275	,70198	,06133
Item 32	131	2,1145	,59019	,05157
Item 33	131	2,0305	,60687	,05302
Item 34	131	2,4656	,61140	,05342
Item 35	131	2,2901	,57497	,05024
Item 36	131	2,4809	,53134	,04642

Item 37	131	2,2824	,63579	,05555
Item 38	131	2,2519	,57303	,05007
Item 39	131	2,3053	,56695	,04953
Item 40	131	2,3053	,56695	,04953
Item 41	131	2,1985	,62536	,05464
Item 42	131	2,2977	,57772	,05048
Item 43	131	2,0611	,60454	,05282
Item 44	131	2,0992	,49389	,04315
Item 45	131	2,2290	,67442	,05892

After the items representing CT strategies with low mean scores were determined, the questionnaire items were reduced to 23 items, and the reformed questionnaire was conducted to 131 students as a post – infusion questionnaire to see to what extent the students developed CT strategies which were taught to them. The following sections demonstrate the development of CT strategies before and after the infusion process.

4.2.2. Analysis of the Strategies

The target strategies which were chosen according to the results of the pre – infusion questionnaire were categorized under three sections: *Affective Strategies* with five strategies, *Macro Abilities* with eight strategies and *Micro Abilities* with one strategy. Thus 14 strategies which were represented by 23 questionnaire items came out. In the post – infusion questionnaire these strategies were included and compared to the results obtained from the pre – infusion questionnaire. However, only the items representing the target strategies were analysed for both questionnaires.

4.2.2.1. Analysis of Affective Strategies

The five Affective Strategies *Thinking Independently, Exercising Fair – Mindedness, Developing Intellectual Humility and Suspending Judgement, Developing Insight into Egocentricity or Sociocentricity* and *Developing Confidence in Reason* were measured in the post – infusion questionnaire and compared to those of the pre – infusion questionnaire. Although the number of the items representing the target strategies was reduced to 23, the item numbers were given according to the original pre – infusion

questionnaire's item order. Table 3. demonstrates the results of the compared mean scores of the items measured in both data collection tools.

Table 3.

Pre and Post Evaluation for Developing Affective Strategies

Affective Strategies					
Strategies	Number	Item Number	Pre-Infusion Questionnaire Mean Scores	Post-Infusion Questionnaire Mean Scores	Difference (+)
1- Thinking Independently	131	Item 1	2,38	2,49	0,11
2- Exercising Fair-Mindedness	131	Item 5	2,10	2,44	0,34
		Item 13	2,09	2,25	0,16
3- Developing Intellectual Humility and Suspending Judgement	131	Item 9	2,28	2,53	0,25
		Item 10	2,26	2,54	0,28
4- Developing Insight into Egocentricity or Sociocentricity	131	Item 6	2,29	2,60	0,31
5- Developing Confidence in Reason	131	Item 3	1,89	2,31	0,42
	131	Item 4	2,16	2,41	0,25

As it can be seen from the results, the mean scores of all the target strategies evidently increased at the end of the procedure. It can be asserted that the students became aware of CT strategies and developed Affective Strategies to some extent. The findings were supported with the qualitative data gathered afterwards.

4.2.2.2. Analysis of Macro Abilities

The eight Macro Abilities *Evaluating the Credibility of Sources of Information, Reasoning Dialogically and Dialectically, Clarifying Issues – Conclusions or Beliefs, Questioning Deeply, Generating or Assessing Solutions, Analyzing or Evaluating Arguments, Reading Critically* and *Listening Critically* were measured in the post – infusion questionnaire and compared to those of the pre – infusion questionnaire. Table 4. demonstrates the results of the compared mean scores of the items measured in both questionnaires.

Table 4.

Pre and Post Evaluation for Developing Macro Abilities

Macro Abilities					
Strategies	Number	Item Number	Pre-Infusion Questionnaire Mean Scores	Post-Infusion Questionnaire Mean Scores	Difference (+)
1- Evaluating the Credibility of Sources of Information	131	Item 15	2,16	2,39	0,23
		Item 16	2,00	2,31	0,31
2- Reasoning Dialogically and Dialectically	131	Item 17	2,12	2,37	0,25
3- Clarifying issues, conclusions or beliefs	131	Item 22	2,07	2,44	0,37
4- Questioning Deeply	131	Item 18	2,24	2,49	0,25
	131	Item 31	2,42	2,64	0,22
	131	Item 33	2,03	2,40	0,37
5- Generating or Assessing Solutions	131	Item 19	2,24	2,54	0,30
6- Analyzing or Evaluating Arguments	131	Item 27	2,37	2,49	0,12
7- Reading Critically	131	Item 14	1,83	2,23	0,40
8- Listening Critically	131	Item 28	2,52	2,74	0,22
		Item 34	2,46	2,58	0,12

A similar improvement can be seen as for the issue of developing Macro Abilities. When the mean scores are examined, the difference might not reflect the level of improvement at first sight. However, the difference between the mean scores can evidently be interpreted as significant rise. Additionally, the number of the items representing the macro abilities can be considered adequate to have an idea about the students' progress in developing macro abilities.

4.2.2.3. Analysis of Micro Abilities

Not so pivotal as they might seem, Micro Abilities also constitute a significant part of CT. Yet, only one micro ability was included in the infusion process in that it might be impossible to teach all the strategies and CTS. The results on the Table 5. demonstrate the development of the micro ability.

Table 5.

Pre and Post Evaluation for Developing Micro Abilities

Micro Abilities					
Strategies	Number	Item Number	Pre-Infusion Questionnaire Mean Scores	Post-Infusion Questionnaire Mean Scores	Difference (+)
1- Noting Significant Similarities and Differences	131	Item 38	2,25	2,45	0,20
	131	Item 39	2,30	2,51	0,21
	131	Item 40	2,30	2,49	0,19

Consequently, deducing from the quantitative data based on the participants own ideas, it can be asserted that the CT infusion through remodeled plans and tasks has made a significant contribution to CTS development of the participants. However, this fact was frequently observed during classes when the students exhibited CT dispositions and answered the task questions successfully. The change in students' CT disposition levels from the beginning to the end of the study could be observed both in their responses to the questionnaire items and in their participation to the task activities.

4.2.3 Analysis of Face – to – Face Interviews

The data obtained from *Face – to – Face Structured Interviews* was analyzed to find out answers to the questions inquiring about the effects of the infusion process on the participants (n: 65) and how they perceived the CT tasks. They were carried out towards the end of research so that the participants would be given enough time to make use of the infusion tasks. The interviews were structured because the researcher did not want the students wander away from the subject because of their age and experience levels. Some questions were 'yes – no' type and the others were open – ended. Data from open – ended questions were analyzed through open thematic analysis and the verbatim sentences were chosen accordingly. Six positive and one negative themes occurred.

When asked the question *"Would you like to be directed by others?"*, 63 participants replied 'No', and the other two said 'Yes". This result might be considered quite significant since CT requires independent thinking. Even if in words, it is vital that the students should gain independent thinking abilities or at least should be aware of the importance of independent thinking.

When directed the question "*Do you always make your own decisions or others make it on behalf of you?"*, the number of those saying they always make their own

decision became 41; and the rest 24 replied they cannot make their own decisions and let others do it for them. Even though the ratio of those who claimed to be independent thinkers almost doubled those who did not, these results apparently demonstrate that more effort should be spend to foster independent thinking and decisiveness in students.

Another question "*Suppose that you have argued with your best friend and that your friendship has broken down hence. Would you consider your behavior and criticize yourself even if you were right?"* was asked in order to measure fair-mindedness. 37 students stated that they would criticize themselves even if they were right, and 28 students said they would not. These results might be considered satisfactory since more than half of the interviewees exhibited disposition of fair-mindedness. Yet, it can also be concluded from the results that human nature has always got to be taken into consideration especially when it comes to challenging the ego.

The question "*Supposing your teacher expressed that she/he was uncomfortable with one of your behaviors and asked you not to exhibit it any longer. Yet, you were not agree with your teacher. What kind of behavior would you exhibit?"* revealed some positive themes. A great number of interviewees (n: 23) stated that they would follow the teacher's advice because of respect.

Student 9: Considering she/he is my elder, I would say I could not notice my behavior was disturbing in the frame of respect.

Student 21: The most important thing for me in this life is respect for elders. Hence I would tell her/him that I would never do it again.

Student 25: I would respect her/his opinion and would never exhibit the behavior.

Table 6.

Themes Representing Behavior patterns

Interview Themes	***n***
Obedience due to respect	23
Self-criticism	14
Sincerity	11
Negotiation	9
Suitability to situation	5
Consultation with others	3
Persistence	5

Some of the students (n: 14) remarked they would criticize their behavior and would give them up if they saw any inappropriateness, or vice versa.

Student 13: I would examine my behavior at first, and then give it up if I saw it was wrong.

Student 40: I would criticize myself and then would act accordingly.

Student 55:I would ask myself what I was doing wrong and would change the behavior if necessary.

Similar number of students (n: 11) said that they would give up their behaviors but would sincerely state their own opinions about the issue.

Student 18: I would never exhibit that behavior but tell my teacher what I think of that behavior.

Student 26: I would frankly state my opinion and stop the behavior for my teacher.

Student 29: Firstly, I would voice my opinion with respect but give up the behavior.

A number of students (n: 9) said that they would talk to the teacher to learn the reason of the disappointment at first, and then would act accordingly.

Student 6: I would ask my teacher why my behavior disturbed her/him. If she/he gave a logical answer, I would give up that behavior.

Student 20: I would ask why my behavior was wrong, and if I admitted my teacher was right, I would never repeat the behavior.

Student 23: I would ask my teacher for the reasons why she/he was disturbed. Then I would act according to the answer.

Interesting as it might seem, some students (n: 5) stated that their teachers' attitude would be deterministic; namely how the teachers approach determines the attitude of students.

Student 3: I would not exhibit that behavior since my teacher asked me not to politely.

Student 55: If my teacher requested me to give up that behavior politely, I would give it up. Otherwise I would keep on my attitude.

Student 62: It depends on how my teachers tells this.

This manner might be indicative of self – confidence or self – esteem. The last students leading positive themes (n: 3) said that they would not act on their own and consult to others like their families or teachers.

The only negative theme emerged from the students' (n:5) statement that they would persist on their behavior and never obey.

Student 11: I would keep on my behavior nonetheless.

Student 12: I do not think a teacher would request politely. They usually tell students off. So I would go on exhibiting my behavior.

Student 37: I would tell my teacher I disagreed and keep on my behavior.

When inquired the question "*Do you consider the knowledge you acquire from a book as absolutely right? If not, how do you acquire knowledge?"*, 54 students stated they do not, and the other 11 said they do. It might be asserted that a great majority of the students became aware of the fact that good thinkers should interrogate and never believe what they see or read at first glance. When asked how they acquire the knowledge, the answers of the students revealed the following themes:

Table 7.

Themes Representing the Attitudes of Students

Themes	***n***
Searching through internet	21
Using other sources	17
Searching through books	8
Consulting to others	6
Searching through encyclopedia	2

Student35: I search through the internet, but I click on a few sites since there are always inconsistencies among websites in terms of knowledge.

Student 50: If I am appealed by the information, I would seek for further information through internet.

Student 20: I search through a number of articles and sources…

Student 57: I look to other sources except internet.

In addition to using the internet and other sources to get information, the following verbatim sentences illustrate that students prefer other sources as well:

Student 31: I look to some other books except the one I have read.

Student 56: I read other books related to the subject.

Student 22: I consult to an elder whose experience I believe is much.

Student 64: I ask others who know about the issue.

Student 44: I firstly search for the information through encyclopedias.

Student 59: To check if the information is true, I look it up in encyclopedias.

The question "*Supposed that you were facing a difficult situation and that you must make a decision immediately. How would you act?"* was another question to make the students reflect on what they learnt during CT task activities, because the ability to decide was exceptionally emphasized throughout the infusion process. In consequence of the answers, the following themes emerged:

Table 8:

Themes Representing the Attitudes of Students 2

Themes	***n***
Remaining calm and slow decision	35
Thinking fast and abrupt decision	27
Preferring to wait and no decision	3

35 students said they would stay calm and make a decision slowly. Being patient and logical can be a crucial part of critical thinking in many ways.

Student 13: According to what I am facing, I stay calm and think.

Student 39: I try to think with a calm head and to find a solution.

Student 51: I try to use my logic staying calm.

27 students stated they could think fast and make a quick decision. Thinking fast and finding immediate answers might be another significant manner of critical thinkers.

Student 2: I think fast and give the best decision according to the situation.
Student 18: I think faster than normal and try to find the best alternative.
Student 37: I think fast and make the best decision for the situation.

A small number of students (n: 3) stated they would prefer to stay inactive as they could not make a decision immediately.

Student 35: I cannot imagine how I will act but probably prefer to wait.
Student 36: I would like to consider the future consequences at first.
Student 47: I try to look at the situation from different perspectives without acting.

The answers to the question *"How do you behave when you solve the problems you encounter?"* do reveal the self – efficacy level of the students. When asked the question, a good number of students (n: 20) said that they would try to understand the problem at first and then act accordingly. Their remarks are as follows:

Student 9: I try to understand the problem well and then go for the best solution.
Student 43: I do my best to comprehend the problem at first.
Student 63: I understand the problem thoroughly before doing something.

Table 9.
Themes Representing the Attitudes of Students 3

Themes	***n***
Understanding the problem	20
Acting on one's own	18
Consulting to others	16
Seeking for reasons	9
Not challenging	1
Remaining indecisive	1

Other students (18) remarked that they would prefer to act on their own.

Student 11: I act on my own unless I have great difficulty.
Student 58: I try to solve it by myself.
Student 62: I act by myself and apply my own ideas.

16 students said they would not act by themselves but consult to other people who could help them.

Student 8: I consult to my family and my friends.
Student 17: I generally solve my problems with a friend of mine.
Student 42: I prefer to take my family's or friends' advice.

Some students (n: 9) stated that they would seek for the reasons behind the problem at first. This result is particularly important in terms of being critical against cases encountered.

Student 6: I find the reasons causing the problem, then I act.
Student 15: I search for the reasons of the problem at first.
Student 29: Firstly, I try find the source of the problem.

The rest of the students (n: 2) said they would not prefer to challenge the problem but remain indecisive. In qualitative studies, no finding should be ignored no matter how trivial it might seem.

The question *"How do you think having "Critical Thinking" skills affect your life?"* was directed to the students to find out the way they perceive CT and whether or not or how it affects their lives. The themes drawn out of answers are below:

Table 10.

Themes Representing the Attitudes of Students 4

Themes	***n***
Fast and right decision	24
Different points of view	20
Personality development	12
Self – esteem	5
Empathy	4

24 students remarked that CT enables them to give fast and right decisions.

Student 5: It provides me with quick and right decisions.

Student 18: It enables me to give right decisions by means of thinking well.

Student 38: It lets me make fast, right and logical decisions.

Some other students (n: 20) stated that CT has provided them with different perspectives.

Student 1: It changes the point of view to people.

Student 33: It helps looking at the problems from different angles.

Student 48: It improves our perspectives of events.

12 students declared that CT has contributed their personality development.

Student 7: It helps me find my personality and get rid of the idea that I am herded like sheep.

Student 19: My desire to interrogate and criticize increases, and this enables me to notice what is true and what is lie.

Student 54: It enhances my ability to make comparison, do research, voice my own opinions and questioning.

Even if it looks like a minor element in interview answers since it was pronounced by only five students, self – esteem concept should exactly be stressed in terms of developing CTS.

Student 8: It helps me stand bravely against those confronting my opinions.

Student 60: It enables me to stand on my own legs.

The rest of the students (n: 4) stated that CT improves the ability of empathy, thereby fostering the fair – mindedness element.

Student 14: It fosters my ability of empathy.

Student 43: It helps us to distinguish the right from wrong by getting in others' shoes.

When the students were asked the question *"How did you perceive the critical thinking tasks?"*, following themes emerged from their answers:

Table 11.

Themes Representing Participants' Perception of CT Tasks

Themes	***n***
Entertaining	28
Didactic	19
Interesting	12
Challenging	4
Boring	2

Student 7: I enjoyed a great deal during the critical thinking activities.

Student 18: Besides having fun, I think critical thinking tasks were instructive.

Student 26: Some tasks were like riddles. I found them interesting.

Student 39: Frankly saying, I had difficulty in fulfilling the tasks.

Student 59: I often got bored during the task activities.

The last question "*Do you think Critical Thinking should be taught at schools? Why or why not?* was directed to the students with the aim of figuring out their opinion about CT education at schools. 63 out of 65 students stated that they are in favor of CT education at school.

Student 6: I think critical thinking education should be given from early ages since it can enable individuals to give right decisions when they are mature.

Student14: I support it. Because there will be qualified people in our society.

Student 28: Absolutely it should. Because it will help us to improve our problem solving skills.

Student 44: Yes, it should be taught at schools. Then a person learns to question and can live freely.

Student 65: I think critical thinking should be taught at schools since it enables humans to form correct personalities.

Only two students objected to the idea that CT should be taught at school. Below are the excerpts of those students.

Student 21: I think critical thinking must not be taught at schools since it requires competent experts. We already deal with the challenges of main subjects. So such an extra education will be meaningless. Yet, experts might come to schools and can give seminars instead.

Student 36: I think it should not be taught. I believe students will misuse this education.

Even though the two statements above seem to oppose CT teaching, it is highly apparent that the participants' concerns are about something else but CT itself.

CHAPTER V

FINDINGS AND DISCUSSION

5.1. Findings and Discussion

The aim of this study was to discover if an infusion model of critical thinking enhanced with remodeled plans and critical thinking tasks would have an effect on high school EFL learners' critical thinking abilities. With this purpose, the data was obtained via pre and post questionnaires and structured face – to – face interviews.

The first research question targeted the participants' awareness level of critical thinking strategies prior to the infusion process. The data was gathered via a critical thinking questionnaire. The participants exhibited critical thinking dispositions at medium level; yet it was not definite if they were aware that those were related to critical thinking skills or not. The results indicated that the participants were aware of some critical thinking strategies but not in an adequate level. Therefore the main purpose of the research was to inform the students about the very essence of critical thinking and the significance of developing critical thinking skills in EFL classes. In the light of this purpose, the students were instructed critical thinking, critical thinking skills and strategies via direct presentation and research homework.

However, teaching students solely critical thinking strategies and informing them about critical thinking skills does not necessarily mean that they are able to absorb the knowledge fully nor they can employ the knowledge into their lives. As Halpern (1999) stated, it would never be adequate to teach pupils critical thinking abilities unless they have a tendency to utilize them. Critical thinking actually means utilizing the right skill in a suitable situation.

The second and third research questions sought answers to the problem whether the critical thinking infusion into English curriculum, supported by remodeled plans and critical thinking tasks, had an effect on the participants' critical thinking dispositions, and how they perceived the critical thinking tasks. To obtain data, structured face – to – face interviews were conducted with a great number of participants (n: 65). The results were analyzed via open thematic analysis and the findings indicated positive results as desired. When the students were asked interview questions targeting to measure the strategy *thinking independently,* the great majority of them (n: 63) stated they would never like to be directed by other people and they (n: 41) would always make decisions on their own.

Some questions were asked with the purpose of finding out the students' *fair-mindedness* level. The answers to these questions varied in shape, yet the context was provided. Some students (23) stated they would obey the advice from teachers just owing to respect. Respect for others can be considered an important element since it might reflect the strategy *intellectual humility* in one term. However, teachers' manner on providing students with such a skill is very crucial. This study revealed one more time that modeling is of a pivotal role in teaching critical thinking. A number of students (n: 14) declared they could criticize their inappropriate behavior if they were warned or criticized. These findings might indicate that those students have already developed *insight into egocentricity or sociocentricity*, which is one of the affective strategies of critical thinking.

Another question asked during interviews was about whether they had blind confidence in whatever they read or see. By far the majority of the students (n: 54) stated that they would never consider any knowledge as absolutely right or wrong. This literally might mean that these students improved the ability to *evaluate the credibility of sources of information* which is another important critical thinking strategy. The students also stated that in order to get the knowledge they search through the internet, books, encyclopedias and other sources like expert people. This might mean that the students mostly developed the skills of *reasoning dialogically and dialectically.* Students were also asked what they would do in case of a difficult situation. Nearly all of them (n: 62) declared they would make a decision by themselves either slowly with patience or abruptly with determination. It can be asserted that these dispositions do align with the strategies *thinking independently* and *developing intellectual courage.*

Students were also asked how they would approach to the problems they face. Some of the students (n: 20) stated they would try to understand the problem at first, which might have resulted from the skill of *clarifying issues, conclusions, or beliefs.* Other students (n: 18) stated they would prefer to act on their own and make their own choice, which reflects the strategy *confidence in reason.* Some other students (n: 9) said they would search for the reasons of the problem, which aligns with the strategies *questioning deeply, generating or assessing solutions* and *analyzing or evaluating arguments.* Only two participants stated they would prefer to remain indecisive and to avoid challenging. Students were also asked how it would affect their lives to have the critical thinking skills. They stated that critical thinking skills might affect their lives in terms of making fast and sound decisions (n: 24), developing different points of view (n:

20), personality development (n: 12), self – esteem (n: 5) and empathy (n: 4). From all these findings, it can be concluded that the vast majority of the participants have understood the value of developing critical thinking skills and they try to exhibit those skills as specific dispositions.

When directed the question how they perceived the critical thinking tasks, a good many students (n: 28) said the tasks were *entertaining* and they enjoyed themselves while trying to find the answers especially to the Socratic questions. Some of the students (n: 19) stated the critical thinking tasks were mostly *didactic* due to the fact that they were stimulated to find answers to task requirements, thereby learning lots of new things by means of doing research. Other students (n: 12) remarked that the tasks were highly *interesting* because it was the first time they had come across such task activities. Only six students reported negative opinions calling the critical thinking tasks *challenging* and *boring*. In qualitative studies, especially conducted at high schools or lower grade schools, it should be considered normal for teenagers to become bored quickly just because of their age (Legault et al., 2006). However, every individual opinion is worth contemplating and should not be neglected.

The significance and necessity of teaching critical thinking skills at schools have been emphasized by a growing body of research and a good number of scholars so far. Finally, the students were asked whether critical thinking skills should be taught at schools or not. This question were answered positively by virtually all the participants. Only two students stated it is not necessary to teach critical thinking skills at schools, by justifying their opinions. Following excerpts demonstrate their remarks:

> *Student 21: I think critical thinking must not be taught at schools since it requires competent experts. We already deal with the challenges of main subjects. So such an extra education will be meaningless. Yet, experts might come to schools and can give seminars instead.*
>
> *Student 36: I think it should not be taught. I believe students will misuse this education.*

The fourth and last research question aimed to find out the critical thinking levels of the participants following the infusion process. The change which the students underwent during the whole educational year was discovered with a post – infusion questionnaire which had the same items with the pre – infusion questionnaire. Such a data

collection format was preferred to see the possible change much better thanks to the same items. Once the data from the second questionnaire was analyzed, the results were compared to those obtained from the first one. In the second questionnaire, the mean values of the sections were *Affective Strategies = 2.45*, *Macro Abilities = 2,43* and *Micro Abilities = 2,48.* Thus it can be observed that there is a significant increase in the participants critical thinking development. These quantitative results were also supported by the qualitative data gathered from the interviews conducted towards the end of the infusion process.

Besides all the data collection instruments used to gather sound data, the students were observed thoroughly during the activities. In the beginning, students seemed reluctant to take part in the activities seeing that they were not familiar with such a way of teaching. This problem was overcome gradually with patience and by adopting a mild manner towards the students. Eventually, the students got accustomed to the tasks and carried them out in groups by means of sharing ideas and making arguments. During the process, modeling of teacher probably played the apical role for developing critical thinking skills in terms of demonstrating the students how they should exhibit critical thinking dispositions. This finding aligns with the study of Kaskey-Roush (2008). From the reactions of the students during the classroom activities, it was observed that the new teaching style was found more entertaining and beneficial than the traditional teaching style based on communicative tasks. Such a result was reached in the research conducted by Karakuzular (2013). This deduction was justified by the academic success of the students in both written and applied English exams. Similar results were also obtained in the research of Chen (2017), Kow (2016), Liaw (2007) and Lin (2014). (For details please see Chapter 2.10.).

Of course no study is free of criticism. Undoubtedly all the findings revealing the significant improvement of the participants' critical thinking skills and the increase in their critical thinking disposition level do not certainly mean that the students developed critical thinking skills equally and completely. Even if all the participants were at the same age and grade, individual differences and educational background of them could have complicated the teaching process. In qualitative studies, it is considered quite normal to go through such hardships and hindrances. Still, it can be claimed that this study has contributed to 10^{th} grade high school students' critical thinking development through a direct infusion into English curriculum. This study is also believed to contribute to the

related literature and to give motivation to other researchers and language instructors who have devoted themselves to raise students with thinking skills.

To conclude, the analysis of quantitative and qualitative data indicated that critical thinking infusion approach enhanced with a variety of critical thinking tasks had a positive effect on students' critical thinking skills development. Nevertheless, the sustainability of the skills which the participants developed is of almost the same importance as acquiring them (Scriven & Paul, 1987). To achieve this, critical thinking education is expected to be included in the curricula of all subjects, and students should be taught critical thinking skills at an early age at schools. It is assumed that this study is going to contribute to the field in that there are not many studies concerning the infusion of critical thinking skills at high school level.

CHAPTER VI

CONCLUSION

6.1. Conclusions

This study was conducted with the aim to explore the potential effects of a direct critical thinking infusion into 10th grade English curriculum. For that purpose, presentations, remodeled lesson plans and critical thinking tasks were prepared in line with the content and themes provided by the Ministry of National Education. For gathering data, Pre and Post Questionnaires and Structured Face – to – Face Interviews were used. The answers to the questions below were sought in this study:

1- What are 10th grade English learners' critical thinking dispositions prior to the infusion of critical thinking skills into curriculum?
2- Does infusing critical thinking skills into English curriculum have an effect on participants' dispositions of thinking critically? If so, in what ways?
3- How do the participants perceive the critical thinking tasks?
4- What are the participants' critical thinking dispositions level following the courses?

The first research question targeted to figure out the students' critical thinking disposition levels before the infusion process. A Critical Thinking Questionairre with 45 items representing the critical thinking strategies and skills was given to the students. The results of the quantitative analysis revealed that the students had critical thinking skills to some extent although they were mostly not aware of what they exbihited was critical thinking skills. However, the first question's answer could be the students' critical thinking disposition level was very low.

The second and third research questions explored whether or not infusion process had an effect on the students' critical thinking dispositions. Besides, the students' opinions about the critical thinking tasks and acitives were asked for. Data was obtained via Structured Face – to – Face Interviews conducted with 65 interviewees towards the end of the study and was analysed thematically. The results demonstrated a significant awareness and development in critical thinking dispositions.

The fourth research question adressed the extent to which the students' critical thinking disposition levels were ascended, if the process was successful. This was carried out via a Post – Questionairre having the same items as the Pre – Questionairre. The quantitative findings compared with those of the pre – questionairre evidently revealed that there was a significant rise in the students' critical thinking disposition levels and the infusion enables the students to develop some certain critical thinking skills.

It can be concluded that the direct infusion of critical thinking skills into EFL classroom by means of remodeling plans and task activities aligning with the curricular goals had some positive effects on the students' critical thinking dispositions and helped them develop certain critical thinking skills.

6.2. Implications

The very aim of this study was to explore if critical thinking skills could be taught to high school students through a direct infusion of critical thinking, enhanced with lesson plans and task activities, into foreign language curriculum. This research yielded some positive results supporting the idea that critical thinking infusion can contribute to learners' critical thinking skills. The fact that participants of the study exhibited significant development in critical thinking dispositions to a remarkable extent is quite promising for other researchers and instructors.

Critical thinking skills are considered among the 21st Century Skills and today, more and more instructors are becoming aware of the value of thinking abilities in raising students who can question, infer, analyse, synthesize and solve problems successfully (Trilling & Fadel, 2009). This doubtlessly cannot be accomplished by means of traditional teaching methods and approaches. So, some new techniques must be improved to meet the requirements of teaching critical thinking skills. However, this ideal requires a great deal of time and diligent effort.

The outcomes of the research indicate that high school learners are most likely to gain critical thinking skills providing that they are given encouragement and proper longitudinal instruction. Nevertheless, it cannot be asserted that the whole target population are able to cultivate critical thinking skills equally. However, it must not be undervalued that nearly all the participants of this study learnt the principles of critical thinking and became aware of the significance of thinking abilities. Through redesigned lesson plans, task activities and group work, it was observed that the students developed

some certain skills such as *thinking independently, fair-mindedness, intellectual humility, insight into egocentricity or sociocentricity, evaluate credibility of sources of information, reasoning dialogically and dialectically, clarifying issues-conclusions or beliefs, confidence in reason, reading and listening critically, questioning deeply, generating or assessing solutions and analysing or evaluating arguments.* As well as similar tasks and acitivites, critical thinking teaching can be infused into EFL curricula, syllabi and textbooks. All these findings might provide implications for language instructors, curriculum designers, textbook writers and researchers in the field.

This study also exposed the cruciality of teacher's modeling in that teachers can serve as not solely primary source of information but a good role model whose critical thinking dispositions can potentially stimulate students to develop thinking skills. Unless teachers themselves are capable of exhibiting critical thinking dispositions, the critical thinking education will most probably not become efficient and successful. This fact may also provide implications for faculties which raise language instructors. The study is believed to contribute to the limited number of studies in the field.

6.3. Recommendations for Further Research

It should be clarified that demographic factors such as gender, age, social background, and other factors which may have been intervened with the results were ignored in this study. These factors can be included in future studies to obtain more detailed results. Besides, the study lasted for a whole educational year which can be considered adequate for teaching critical thinking skills. Hence, researchers should be very meticulous about the duration of their studies since time is highly essential in developing thinking abilities.

Additionally, the study covered 131 students of different four 10^{th} grade classrooms. This can be considered a good sampling size now that the data was gathered from a great number of participants. For this reason, it might be beneficial for further studies to include good numbers of participants so as to observe several diversities and infer different conclusions from target groups. Since differences might serve as a significant element for evaluation.

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APPENDICES

Appendix 1. Critical Thinking Questionnaire

CRITICAL THINKING QUESTIONNAIRE

Dear students,

This questionnaire deals with the use of ***Critical Thinking*** in English classes to increase the success in learning English and is being conducted to measure your critical thinking dispositions. I wish you to fill in the questionnaire sincerely.

Emrah AKDAĞ

Teacher of English

Name:

Age:

Tick (X) the most appropriate option (*Never, Sometimes, Usually, Always*) for you below.

Affective Strategies		**Never**	**Sometimes**	**Usually**	**Always**
1	I do not immediately believe what other people do and say.				
2	I am patient enough. Even if my assignment is difficult, I fall on it and finish it.				
3	I am not afraid to make a mistake when answering a question.				
4	I like finding answers to challenging questions.				
5	I do not get confused or offended when asked a question.				
6	I strive to be a person as I expect from others.				
7	I do not let my feelings lead me when I decide something.				

Appendix 1 (continued)

8	I follow a proper and orderly way to solve the problems I encounter.				
9	My mind is open to new causes and evidences; thus I can fix my prejudiced thoughts more easily.				
10	When I fall into disagreement with other people, I try to look at the events through their eyes.				
11	Being insistent on solving a problem is always better than giving up on it.				
12	I can question the underlying causes of rules, events, and bases.				
13	I accept that I am not always 100% right.				

Cognitive Strategies – Macro Abilities		**Never**	**Sometimes**	**Usually**	**Always**
1	I do research about it until I understand what I read and ask questions.				
2	I do not believe what others do and say.				
3	I can understand which information comes from a correct and reliable source, and which one comes from a false and misleading source.				
4	I ask questions to learn a topic in detail.				
5	I can ask appropriate questions to understand and assess a situation.				

Appendix 1 (continued)

6	I use everything that I own to get the best result.				
7	I am good at extracting the main idea of a text.				
8	I can make a new sentence by using the synonym and antonym of a word.				
9	I can simplify the information to make things easier and clearer.				
10	I plan my goals and the way I reach them.				
11	I can sort subjects into classes and groups.				
12	I can use the new words which I learn from an English text in other places as well.				
13	I ask "why and why" questions to reach more than the basic knowledge.				
14	There are many ways to reach a goal or solve a problem.				
15	I respect the views of my friends and listen to them willingly.				
16	Just knowing the definitions is not enough for me. I see if there are clear examples of definitions.				
17	I simplify the problems to solve them.				
18	Asking questions is an effective way of reaching the desired information.				

Appendix 1 (continued)

19	I ask questions to learn a topic in detail.				
20	I ask questions to solidify what I have learnt.				
21	I listen carefully to what my friends say.				

Cognitive Strategies – Micro Abilities		**Never**	**Sometimes**	**Usually**	**Always**
1	I approach the problems realistically.				
2	I can distinguish what I know from what I do not know.				
3	I can make a difference between facts and ideals.				
4	I can describe the similarities between two or more things.				
5	I can tell the difference between two or more things.				
6	I can compare two or more things.				
7	I can support my answers with justifications and evidence.				
8	I can make a sense of it from the headline and pictures of a story.				
9	I create possible solutions to achieve the best result.				
10	I can choose and use the most appropriate words to express my ideas accurately and easily.				
11	I have realistic ideals and I work hard to reach them.				

Appendix 2. Eleştirel Düşünme Anketi

ELEŞTIREL DÜŞÜNME ANKETI

Sevgili öğrenciler,

Bu anket İngilizce öğrenmede başarıyı artırmak için ***Eleştirel Düşünce***'nin İngilizce derslerinde kullanılması ile ilgilidir ve eleştirel düşünce eğiliminizi ölçmek için uygulanmaktadır. İçtenlikle cevap vermeniz dileği ile.

Emrah AKDAĞ

İngilizce Öğretmeni

Name:

Age:

Aşağıdakilerden (*Asla, Bazen, Genellikle, Her zaman*) size en uygun olanı (X) işareti koyarak seçiniz.

Etkin Stratejiler		**Asla**	**Bazen**	**Genellikle**	**Her zaman**
1	Başkalarının yaptıklarına ve söylediklerine hemen inanmam.				
2	Yeterince sabırlıyımdır. Ödevim zor olsa bile, üzerine düşer ve onu bitiririm.				
3	Bir soruya cevap verirken hata yapmaktan korkmam.				
4	Zorlayıcı sorulara cevap bulmaktan hoşlanırım.				
5	Soru sorulduğunda kafam karışmaz ya da buna gücenmem.				
6	Diğer insanlardan beklediğim gibi birisi olmaya çalışırım.				
7	Bir şeye karar verirken duygularımın beni yönlendirmesine izin vermem.				

Appendix 2 (continued)

8	Karşılaştığım problemleri çözmede düzgün ve düzenli bir yol izlerim.				
9	Zihnimi yeni nedenlere ve kanıtlara açık tutarım, böylece önyargılı düşüncelerimi daha kolay düzeltebilirim.				
10	Diğer kişiler ile aynı fikirde olmadığım konularda onların gözüyle olaya bakmaya çalışırım.				
11	Bir problemi çözmekte ısrarcı olmak ondan vazgeçmekten her zaman daha iyidir.				
12	Kuralların, etkinliklerin ve kaidelerin altında yatan nedenleri sorgulayabilirim.				
13	%100 her zaman haklı olmadığımı kabul ederim.				

Bilişsel Stratejiler-Makro Beceriler		**Asla**	**Bazen**	**Genellikle**	**Her zaman**
1	Okuduğumu anlayana kadar onunla ilgili araştırmalar yapar ve sorular sorarım.				
2	Başkalarının yaptıklarına ve söylediklerine inanmam.				
3	Hangi bilginin doğru ve güvenilir bir kaynaktan geldiğini ve hangisinin yanlış ve yanıltıcı bir kaynaktan geldiğini anlayabilirim.				
4	Bir konuyu detaylıca öğrenmek için sorular sorarım.				
5	Bir durumu anlamak ve değerlendirmek için uygun sorular sorabilirim.				

Appendix 2 (continued)

6	En iyi sonucu elde etmek için elimde bulunan her şeyi kullanırım.				
7	Bir metinin ana fikrini çıkarmada iyiyimdir.				
8	Bir kelimenin eş ya da zıt anlamlısını kullanarak yeni bir cümle oluşturabilirim.				
9	Bir şeyleri daha kolay ve anlaşılır hale getirmek için bilgileri basitleştirebilirim.				
10	Hedeflerimi ve onlara nasıl ulaşacağımı planlarım.				
11	Konuları sınıflara ve gruplara ayırabilirim.				
12	İngilizce bir okuma metninden öğrendiğim yeni kelimeleri, başka yerlerde de kullanabilirim.				
13	Temel bilgiden daha fazlasına ulaşmak için "neden- niçin" sorularını sorarım.				
14	Bir hedefe ulaşmanın veya bir problemi çözmenin birçok yolu vardır.				
15	Arkadaşlarımın görüşlerine saygı duyarım ve onları istekli bir şekilde dinlerim.				
16	Sadece tanımları anlamak benim için yeterli değildir. Tanımlar ile ilgili açık ve net örneklerde var mı diye bakarım.				
17	Problemleri çözebilmek için onları basitleştiririm.				
18	Soru sormak istenilen bilgilere ulaşmada etkin bir yoldur.				
19	Bir konuyu detaylıca öğrenmek için sorular sorarım.				
20	Öğrendiğimi pekiştirmek için sorular sorarım.				
21	Arkadaşlarımın söylediklerini dikkatlice dinlerim.				

Appendix 2 (continued)

Bilişsel Stratejiler-Mikro Beceriler	**Asla**	**Bazen**	**Genellikle**	**Her zaman**
Problemlere gerçekçi bir şekilde yaklaşırım.				
Bildiklerimi bilmediklerimden ayırt edebilirim.				
Gerçekler ve idealler arasındaki farkı ayırabilirim.				
İki ya da daha fazla şeyin arasındaki benzerlikleri anlatabilirim.				
İki ya da daha fazla şeyin arasındaki farklılıkları anlatabilirim.				
İki ya da daha fazla şeyi kıyaslayabilirim.				
Cevaplarımı gerekçeleri ve kanıtları ile destekleyebilirim.				
Bir hikâyenin başlığından ve resimlerinden onunla ilgili bir anlam çıkarabilirim.				
En iyi sonuca ulaşabilmek için olası çözümler oluştururum.				
Fikirlerimi doğru bir şekilde ve kolaylıkla anlatabilmek için en uygun kelimeleri seçip kullanabilirim.				
Gerçekçi ideallerim var ve onlara ulaşmak için çok çalışıyorum.				

Appendix 3. Consent Form

CONSENT FORM

RESEARCH ETHICS : **STUDENT CONSENT FORM**

THE PROJECT TITLE : **"INFUSION OF CRITICAL THINKING ABILITIES INTO HIGH SCHOOL ENGLISH CURRICULUM: A SEQUENTIAL EXPLANATORY RESEARCH DESIGN OF DEVELOPING THINKING SKILLS IN THE 10TH GRADE STUDENTS"**

RESEARCHER : **Emrah AKDAĞ**
POSITION : **English Teacher**
ADDRESS : **Çukurova Emine Nabi Menemencioğlu Anadolu Lisesi**
Çukurova / ADANA

Please Initial Box

1. I confirm that I have read and understood the information sheet for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time. ☐

3. I agree to take part in the above study. ☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of Researcher	Date	Signature

*This research is appropriate for the students to take part in.

….. / ….. / 20…

……

Headmaster

Appendix 4. Remodeled Critical Thinking Lesson Plan Sample

CRITICAL THINKING LESSON PLAN

Teacher: Emrah AKDAĞ **Lesson Date:** Dec 9th, 2017
Subject: Textbook – UNIT: *Intercultural Topics* **Duration:** 4 x 40 mins

Functions of the Unit:	**Materials & Tasks:**
• Identifying cultural differences • Asking about and describing cities • Talking about travel and tourism • Asking about and giving direction	1. Transportation schedules 2. Graphics and charts 3. Maps , brochures, handbooks 4. Role play 5. Guessing 6. Inference 7. Discussion

SKILLS: *(What skills are the students supposed to acquire?)*

- ***Listening:*** Students will be able to infer situations and identify the lexical compounds related to intercultural topics.
- ***Speaking:*** Students will take part in the conversations in the situations which might occur while travelling.
- ***Reading:*** They will be able to scan texts describing famous cities, get the idea of the content and scan timetables.
- ***Writing:*** They will be send a booking e-mail and fill out a registration form.

TIME	INSTRUCTIONAL SEQUENCE	FORMATIVE ASSESSMENT Note: A variety of formative assessments should be used at key points throughout the lesson.
7 mins	**Get started/Drill/Do Now:** *(What meaningful activity will students complete as soon as they enter the classroom?)* • Students are asked to share their ideas about a photograph of an airport asking the following leading questions: - *Look at the picture. What do you see?* - *Where are the people? What are they doing?* - *Have you ever been to an airport?* ***Strategies Used to Remodel*** **S-32 making plausible inferences, predictions, or interpretations** **S-29 noting significant similarities and differences**	**Minute papers are filled and feedback is given to students.**
8 mins	**Engage/Motivation:** • A famous quote by former secretary-general Kofi Annan is given to the students. ***"Knowledge is power, information is liberating. Education is the premise of progress"***. In this quotation, Kofi Annan emphasizes the importance of education and knowledge. Students read the quote and are asked the students to share their ideas. To help them, some key words such as advancement, ignorance, literacy are given.	**Probing questions are asked to get deeper information from the students.**

Appendix 4 (continued)

<table>
<tr>
<td></td>
<td>
Strategies Used to Remodel
S-13 clarifying issues, conclusions, or beliefs
S-32 making plausible inferences, predictions, or interpretations
S-35 exploring implications and consequences
</td>
<td></td>
</tr>
<tr>
<td>15 mins</td>
<td>
Lead in Activities: In this part, students learn the airport vocabulary. They match the words with the pictures.
<table>
<tr><td>1. land</td><td>2. take off</td><td>3. a passenger and an agent</td><td>4. dep</td></tr>
<tr><td>5. arrive</td><td>6. go through security</td><td>7. boarding pass</td><td>8. get</td></tr>
<tr><td>9. board</td><td>10. check-in desk</td><td>11. departures board</td><td>12. gat</td></tr>
<tr><td>13. departures lounge</td><td></td><td></td><td></td></tr>
</table>
Later they complete the gaps using the expressions above so that they can use them in a meaningful context. Then they listen to the track and check their answers.

Strategies Used to Remodel
S-14 clarifying and analyzing the meanings of words or phrases
S-22 listening critically: the art of silent dialogue
S-31 distinguishing relevant from irrelevant facts
</td>
<td>Students listen to the track and check their answers. They are asked to identify the new concepts related to the new lexis.</td>
</tr>
<tr>
<td>10 mins</td>
<td>
Everyday English: The idiom “When in Rome, do as Romans do” is given and students are asked to guess the meaning of the proverb: When you go to a country, you should conform to the norms of the society.

Strategies Used to Remodel
S-1 thinking independently
S-18 analyzing or evaluating arguments, interpretations, beliefs, or theories
S-28 thinking precisely about thinking: using critical vocabulary
</td>
<td>Giving information about intercultural competence and asking for opinions.</td>
</tr>
<tr>
<td>20 min</td>
<td>
Let’s Read and Listen: The following conversation is read and then listened by students after they are asked to guess what the text might be about from the picture.

Listening text (Track 35)
Matt: Excuse me. Is this bag yours?
Jordan: Oh, yeah, thank goodness. It’s been a really long flight. I feel exhausted.
Matt: No problem, but you shouldn’t leave your bag unattended. Do you need help?
Jordan: Well, I am looking for a duty free shop.
Matt: Turn right at the departures board. It’ll be straight ahead of you. Actually, that’s whe
can follow me.
Jordan: Where are you flying today?
Matt: To Barcelona. Then I am changing to La Figuera.
Jordan: What a coincidence, I am flying to Barcelona, too. Is it flight TK 1265?
Matt: Yes, but we should hurry. The plane will take off in 45 minutes.

Students find the underlined statements and choose the best option closest in meaning.
</td>
<td>Pre-reading, while-reading and post-reading questions are asked.</td>
</tr>
</table>

Appendix 4 (continued)

	Thank goodness: I'm relieved. *I feel exhausted:* I am very tired. *I'm changing to….:* I am connecting to… *What a coincidence!:* That's a good ma Students are asked to find out the meanings of the words from the context and discuss their meanings both in pairs and as a whole class. Later they act out the dialogue in pairs. *Strategies Used to Remodel* **S-14 clarifying and analysing the meanings of words or phrases** **S-28 thinking precisely about thinking: using critical vocabulary**	
20 mins	**Collaboration Activity:** *(How will the students collaborate?)* • One student becomes an airline officer on the desk and another becomes a passenger. The class is divided into 3 groups and each of them writes a scenario using the new vocabulary. Later the dialogues are acted out and the best scenario is voted on by the class. *Strategies Used to Remodel* **S-9 developing confidence in reason** **S-11 comparing analogous situations: transferring insights to new contexts** **S-15 developing criteria for evaluation: clarifying values and standards**	**Acting out a situation and trying to figure out what goes best for the situation.**
15 mins	**Reading and Listening Activity:** Students are taught the way to give directions via the prepared table and animation on the smart board. They are shown some pictures and asked to match the pictures with the sentences. Then they listen and check the answers. **Exercise A:** A map is shown on the board and different points are marked. Then the students draw the right directions on the map. Later, directions are given in advance and the points are marked accordingly. **Exercise B:** Adana is found in Google Earth software and the students are asked to find some locations from a bird's eye view. *Strategies Used to Remodel* **S-19 generating or assessing solutions** **S-22 listening critically: the art of silent dialogue**	**Do we know our city well?**
15 mins	**Reading Comprehension** *(Skimming and scanning skills)* In this activity, students read the texts about Berlin, Cambridge, Sydney and Mumbai. • They do skimming in 3 minutes and find the key words. • They are given a chart the blanks of which students are supposed to fill with the information about four cities. • They find the information in a limited time because rather than detailed comprehension. The aim is to make learners recognize specific information in the given text in a limited time (3 mins for scanning). *Strategies Used to Remodel* **S-21 reading critically: clarifying or critiquing texts** **S-29 noting significant similarities and differences**	

Appendix 4 (continued)

<table>
<tr>
<td>10 mins</td>
<td>Speaking activity: In this activity, students complete the questionnaire in their course book about their holiday preferences and in exercise b, they ask and answer the questions about their ideal holiday to their partner in class. This exercise has been designed to activate students' content schemata and prepare them for the upcoming writing task. Answers may vary.
Subsequently, students are asked to create interviews and act them out in pairs.

Strategies Used to Remodel
S-6 developing intellectual courage
S-17 questioning deeply: raising and pursuing root or significant questions
S-33 giving reasons and evaluating evidence and alleged facts</td>
<td></td>
</tr>
<tr>
<td>15 mins

25 mins</td>
<td>Writing activity: A text written by a students about the city s/he would like to visit in the future is read and the blanks are filled with the appropriate transitions below:

But, because, also, so, and.

Then the students are asked to write a short paragraph about a city they would like to visit using the linking words above. To do that, they are asked to do research on internet beforehand and to give logical reasons for their wish to visit the places.
After students complete their paragraphs, they will be equipped with a checklist below so that they can read other paragraphs in class as well.

PEER EDITING CHECKLIST
<table><tr><td>Punctuation</td><td>I checked my friend's work for comma(,) and full stop (.)</td><td></td></tr><tr><td>Grammar</td><td>Each sentence has a subject and a verb.</td><td></td></tr><tr><td>Linkers</td><td>My friend used the linkers (and, so, but, also, because, but) correctly in the paragraph.</td><td></td></tr><tr><td>Spelling</td><td>I checked spelling and corrected the words that didn't look right.</td><td></td></tr></table>
Strategies Used to Remodel

S-4 exploring thoughts underlying feelings and feelings underlying thoughts
S-9 developing confidence in reason
S-33 giving reasons and evaluating evidence and alleged facts</td>
<td></td>
</tr>
</table>

Appendix 5. Critical Thinking Tasks Samples

CRITICAL THINKING TASKS SAMPLES

Name _____ Date _____

The Quick Brain Teaser Pack- Version 1

1. Does England have a 4th of July?

2. 7 months have 31 days in them. 11 months have 30 days in them. How many months have 28 days in them?

3. How many birthdays does the average person have?

4. What is sweetened then soured, boiled then cooled?

5. A woman gives a hobo 50 cents; the woman is the hobo's sister, but the hobo is not the woman's brother. How can this be?

Appendix 5 (continued)

Name _____ Date _____

The Quick Brain Teaser Pack- Version 3

1. See if you can explain this one...

Two men play five games of chess. Each man wins the same number of games. There are no ties.

2. What is pronounced like a single letter, written with 3 letters, and most animals have two of them?

3. A man builds a rectangular house. All sides of the house are exposed to the south. A huge bear walks by. What color is the bear? Why?

4. What is the beginning of eternity, the end of time and space; the beginning of every end, and the end of every race?

5. What is lighter than a feather, but cannot be lifted?

Appendix 5 (continued)

Name _____ Date _____

MAKING PREDICTIONS

Directions:

USE INFORMATION YOU ALREADY KNOW AND WHAT THE AUTHOR IS TELLING YOU TO MAKE A PREDICTION. A PREDICTION IS WHAT YOU THINK WILL HAPPEN.

1. Jessie and Freddie put on their snow suits. They got their hats, boots, and scarves. They went outside and began to roll the snow in three large balls. They put the largest ball on the bottom and stacked the snow balls on top of each other. They went to look for two sticks.

MAKE A PREDICTION:

_____

_____

_____

_____.

2. Sara and her Mother drove to the computer store. Sara had her money she had received for Christmas and the money she had saved. She waited a long time for this day. Finally, she would be able to look up all the things she needed for school on a computer and email her friends.

MAKE A PREDICTION:

_____

_____

Appendix 5 (continued)

3. The storm began suddenly. The lightening lit up the sky and the thunder roared loudly. The electricity was blinking on and off quickly.

MAKE A PREDICTION:

_____

_____

_____

_____.

Appendix 5 (continued)

Name _____ Date _____

Summer Vacation Reports

Compare means to look for things that are the same.

Contrast means to look for things that are different.

The third grade class just got back from summer vacation. The teacher asked each student to write a short report about what they did during the summer vacation. Read the two reports below.

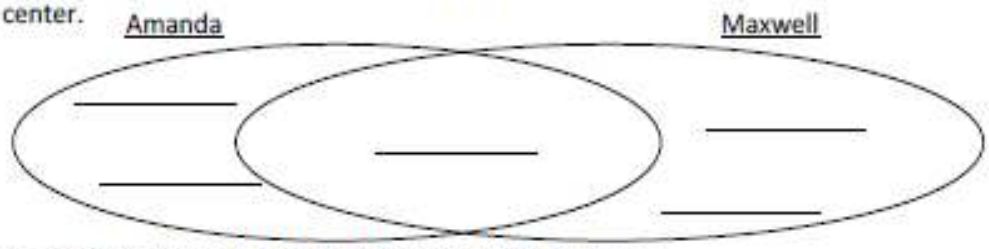
Amanda's Report: What I Did On Summer Vacation

I went on vacation at the beach last summer. My brother and I played in the ocean and built castles out of sand. I also read lots of books last summer. My favorite book was The Secret Garden. At the end of the summer, my mom and dad took me to the water park and we went swimming. It was fun!

Maxwell's Report: What I Did On Summer Vacation

I went on a car trip with my dad last summer. We drove a long way. I also read a book last summer called The Hardy Boys. It was an adventure story. I went to summer camp with my best friend too. I had a great time.

Amanda and Maxwell each wrote about three things last summer. Write the things that they did on the lines below. Put the item that both of them did in the center.



Extra idea: Make a list of the things you did last summer.

Appendix 5 (continued)

FACT AND OPINION

A fact is something that is true or can be proven. An opinion is your feelings or how someone else feels about a particular topic. Read the sentences below and write either fact or opinion after the sentence. Read carefully and use your best handwriting.

Directions: Write fact or opinion after each of the following statements.

1. Abraham Lincoln was President of the United States during the Civil War. _____
2. My favorite music group is TLC . _____
3. Thanksgiving is celebrated in November in America. _____
4. Students must pass a graduation test in Georgia. _____
5. The red velvet cake Mrs. Harvey made was delicious. _____
6. Students achieving A Honor Roll for the first semester will be recognized for their hard work. _____
7. My Mother feels all students should be required to wear school uniforms. _____
8. George Washington Carver was a famous inventor. _____
9. I really enjoyed the football game last weekend. _____
10. The Presidential Election is held in November. _____

Appendix 5 (continued)

Name _____ Date _____

Catch that Bicycle!

2 boys on bicycles, 20 miles apart, began racing toward each other. The instant they started, a fly on the handle bar of one of the bikes started flying toward the other bike's handle bar. As soon as it reached, it turned around and went to the other bike and so on until the bikes met. If each bike had a constant speed of 10 mph, and the fly was traveling 15 mph constantly, how far did the fly travel?

Answer:

CURRICULUM VITAE

Personal Data

Name	: Emrah AKDAĞ
Place and Date of Birth	: Tarsus – 31.12.1975
E-mail	: emrah_akdag@yahoo.com

Educational Background

2016	(MA)	Çukurova University, Institude of Social Sciences
1993 – 1998	(BA)	Selçuk University, English Language and Literature Dep.
1989 – 1992		Tarsus Cengiz Topel High School

Experience

1998 -	English Teacher, Ministry of National Education

Publications

Akdağ, E., & Özkan, Y. (2017). Enhancing Writing Skills of EFL Learners through Blogging. *The Reading Matrix: An International Online Journal*, *17*(2).