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Infusing Critical Thinking Skills into High School EFL Classroom

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ABSTRACT

Critical Thinking Skills (CTS) are at the forefront of 21st Century Skills; and nations shape their education systems according to this phenomenon. Critical Thinking (CT) should be considered as one of the inevitable goals of education since thinking skills are very pivotal for a society characterized by the current shift from labor – dependent to knowledge – based era. Therefore, educating students as effective thinkers in our world of cognitive development should become one of the main objectives of education policy. With this study, which was based on infusing critical thinking skills into the 10th grade English classes, it was aimed to explore whether an infusion model would be beneficial in gaining students with CTS in English classes. The data obtained through questionnaires and interviews indicate that infusion of CTS into EFL classroom yielded some positive results. It was also observed that English lessons enriched with remodeled lesson plans as well as 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. This study also includes implications for similar studies to be conducted on the field.
Keywords: Critical thinking skills; teaching critical thinking; infusing thinking skills; English teaching; EFL classroom; 21st Century skills.

INTRODUCTION

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 it difficult to keep pace with such an epoch as ours. It is an inevitable fact that our world has been undergoing a dramatic and tremendous change particularly in the last a few decades (Saavedra&Opfer, 2012; Trilling & Fadel, 2009; Voogt&Roblin, 2012), and this change requires mastering several skills like digital media literacy which was beyond imagination five decades ago (Trilling &Fadel, 2009).These new skills are called "21st Century Learning and Innovative Skills" by many (Pearlman, 2010; Trilling &Fadel, 2009), and Critical Thinking Skills (CTS) 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.

The question of "What is critical thinking?" has always been at the very center of the literature concerning critical thinking (Beaumont, 2010; Ennis, 1990; Fisher, 2001; Moran, 2012). 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; Hullfish& Smith, 1961; Kitchener, 1986; Paul & Elder, 2001).

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) remarked that thinking process requires something to work properly since facts themselves are not adequate to establish accurate knowledge and thinking competency. 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).

Today, CT is widely taught in the light of some strategies 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. 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, 2006). 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.

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. 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). 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) obtained the results indicating that students with CTS can think critically and fruitfully so as to accomplish the curricular goals; reach true decisions and solve problems more easily; use their thinking abilities; understand contents of language better and can become balanced in physical, emotional, intellectual and spiritual ways.

The role of language instructors is very crucial in teaching a foreign language into which CTS are infused. 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. 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.

The purpose of this study was to investigate the potential effects of the CTS infusion into 10th grade English classes through remodeled lesson plans and authentic tasks. In 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 an infusion of 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?

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. This is why schools are probably the best places to learn about CT and to develop CTS. 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. 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, 2011).

In high school education (MEB, 2011) program, 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). 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).

METHODOLOGY

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: In the first phase, participants' awareness of CTS was measured through a pre – infusion questionnaire. The strategies with low scores were found out and were involved in the process according to the results. In the second phase, students were given CT tasks regularly in English classes through remodeled unit plans, which were prepared according to CT principles. Finally a post questionnaire and structured interviews were conducted to obtain the relevant data representing the result of the infusion process. 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.

Participants

The research involved four 10th grade classes (131 students) at a high school in central Adana, Turkey. Convenience sampling could be mentioned in this study since the researcher was still teaching all the classes, thereby solving the problem of accessibility.

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 similar, indicating a homogenous group.

Data collection tools

Quantitative data was collected through a three – section pre – infusion questionnaire, adapted by Bedir (2016), which consists of 45 items representing 35 CT strategies (taken from www.criticalthinking.org) prior to the infusion process. The questionnaire had already been used in a project concerning CTS (Bedir, 2016), and the items were re-examined with the scholar himself. Besides, the questionnaire was examined by two other scholars who did research on Critical Thinking at the faculty in terms of validity and reliability; and the items were found appropriate to reflect the 35 CT strategies and to yield data related to research questions. The detailed questionnaire containing the strategies of critical thinking 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, the same questionnaire as the post – infusion questionnaire was conducted to find out whether or not the CT infusion supported by remodeled lesson plans and CT tasks contributed to the participants' thinking 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 questions were prepared with the counseling of two other scholars who are experts on CT. The questions represented situations and scenarios through which the students could exhibit CT dispositions. The interviewees (n: 65) were determined via voluntary response sampling.

Interviews were structured including open-ended and closed (yes-no) questions administered in mother tongue in order that the participants could state their opinions comfortably. 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.

Procedure

The researcher informed the school management about the study he was going to conduct since 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. The CT strategies 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 and tasks, prepared by getting assistance from a scholar and his research, were used to promote CT skills of the participants while learning English. While preparing the lesson plans, Numrich's sequence of CT tasks (cited in Beaumont, 2010) containing *observing, identifying assumptions, understanding and organizing, interpreting, inquiring further, analyzing and evaluating* and *making decisions* phases were based upon. 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.

DATA ANALYSIS

Analysis of Pre and Post Questionnaires

The five Affective Strategies, *Thinking Independently, Exercising Fair–Mindedness, Developing Intellectual Humility and Suspending Judgment, 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. Table 1. demonstrates the results of the compared mean scores of the items measured in both data collection tools.

Table 1. Pre and Post Evaluation for Developing 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

The results clearly show a significant raise in the score points before and after the CT infusion especially in developing confidence in reason.

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 2 demonstrates the results of the compared mean scores of the items measured in both questionnaires.

Table 2. Pre and Post Evaluation for Developing 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

Table 2 also reveals the increase of CT awareness in the students especially in terms of questioning and reading critically skills.

Not as pivotal as they might seem, Micro Abilities also constitute a significant part of CT. A micro ability was included in the infusion process since it might be impossible to teach

all the strategies of CTS. The results on the Table 3 demonstrate the development of the micro ability.

Table 3. Pre and Post Evaluation for Developing 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

In order to analyze the data statistically, a t-test was run. As a result of the t-test of the data obtained from the pre and post questionnaire via SPSS 21.0, the following results occurred:

Table 4. Paired Samples Statistics of Pre-test and Post-test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreTest	2,1851	131	,24019	,02099
	PostTest	2,4502	131	,19766	,01727

The results on Table 4. indicate the overall increase in the mean scores; and the standard deviation score of the Post-test indicates that the data points tend to be close to the mean score.

Table 5. Paired Samples Test of Pre-test and Post-test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 PreTest PostTest	-,26514	,09668	,00845	-,28185	-,24843	-31,390	130	,000

As a result of the Paired samples t-test, the Significant value is ",000", which means there is a significant difference between the pre and post infusion process; and the students have developed certain CTS. In order to find out the size of effect to support the findings further, the "d" value was measured to be *1,2*. According to the general guidelines, the ranges are (0.2) low, (0.5) medium and (0.8) large when interpreting the effect of an intervention. With Cohen's d of *1,2*, it can be interpreted that 80,19 % of the students were likely to make a higher score after the intervention. As a result, it can be assumed that the effect size is large and the infusion process contributed to the students' development of CTS.

The overall results show that the students have evidently developed CT strategies by means of explicit CT teaching supported with CT tasks and remodeled lesson plans.

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.

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 did not agree with your teacher. What kind of behavior would you exhibit?*" revealed some themes demonstrated in Table 6.

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

Even though the majority of the students (n=23) exhibited a manner which might not suit CT, the demographic and cultural values might overweigh in Turkish context. Below are the excerpts from the interviews and each student was coded as "S+n":

> *Considering she/he is my elder, I would say I could not notice my behavior was disturbing in the frame of respect (S9). I would examine my behavior at first, and then give it up if I saw it was wrong (S13). I would never exhibit that behavior but tell my teacher what I think of that behavior (S18).*

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

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 students' behavior patterns

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.

> *According to what I am facing, I stay calm and think (S13). I try to think with a calm head and to find a solution (S39).*

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.

> *I think fast and give the best decision according to the situation (S2).*

The answers to the question *"How do you behave when you solve the problems you encounter?"* did 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.

Table 9.Themes Representing the Attitudes of Students

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

Their remarks are as following:

> *I try to understand the problem well and then go for the best solution (S9). I do my best to comprehend the problem at first (S43). I understand the problem thoroughly before doing something (S63).*

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

> *I act on my own unless I have great difficulty (S11). I try to solve it by myself (S58).*

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

> *I consult to my family and my friends (S8). I generally solve my problems with a friend of mine (S17).*

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 situations encountered.

> *I find the reasons causing the problem, and then I act (S6). I search for the reasons of the problem at first (S15).*

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

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.

> *It provides me with quick and right decisions (S5). It enables me to give right decisions by means of thinking well (S18).*

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

> *It changes the point of view to people (S1). It helps looking at the problems from different angles (S33).*

12 students declared that CT has contributed their personality development.

> *It helps me find my personality and get rid of the idea that I am herded like sheep (S7). My desire to interrogate and criticize increases, and this enables me to notice what is true and what is lie (S19).*

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.

> *It helps me stand bravely against those confronting my opinions (S8). It enables me to stand on my own legs (S60).*

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

> *It fosters my ability of empathy (S14). It helps us to distinguish the right from wrong by getting in others' shoes (S43).*

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

Table11. Themes Representing Participants' Perception of CT Tasks

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

Below are the verbatim sentences demonstrating the students' perception of tasks.

> *I enjoyed a great deal during the critical thinking activities (S7). Besides having fun, I think critical thinking tasks were instructive (S18). Some tasks were like riddles. I found them interesting (S26). Frankly saying, I had difficulty in fulfilling the tasks (S39). I often got bored during the task activities (S59).*

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. They approached the idea as follows:

> *I think critical thinking education should be given from early ages since it can enable individuals to give right decisions when they are mature (S6). I support it. Because there will be qualified people in our society (S14). Yes, it should be taught at schools. Then a person learns to question and can live freely (S44). I think critical thinking should be taught at schools since it enables humans to form correct personalities (S65).*

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, 131 participants were involved in a longitudinal study into which a number of specific Critical Thinking Strategies were infused through remodeled lesson plans and tasks. 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 representing 35 CT Strategies. The quantitative results of the questionnaire out of t-test indicated that the participants were aware of critical thinking strategies to some extent but not in an adequate level; and nearly all the participants did not have a clear idea about what CT was, nor were they able to exhibit CTS. This stage was particularly crucial since it would be possible to plan the infusion procedure only through determining the most significant strategies which students lacked the most.

The second research question sought answers to the issue 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. 65 students were directed a number of situational questions targeting to measure their CT and disposition levels. The questions were significantly prepared to target the strategies *thinking independently; fair-mindedness*; *intellectual humility; developing insight into egocentricity or sociocentricity*; *evaluate the credibility of sources of information; reasoning dialogically and dialectically; developing intellectual courage; clarifying issues, conclusions, or beliefs; confidence in reason; questioning deeply; generating or assessing solutions* and *analyzing or evaluating arguments.* The data, gathered out of content analysis clearly indicated that the vast majority of students gave reasonable answers to each question and developed appropriate behavior patterns for the scenarios they were given. It can be asserted that the CT instruction enhanced with CT tasks forming of Socratic questions and scenarios did contribute the students to develop CTS. The students were also asked how it would affect their lives to have the critical thinking skills. Virtually all the students gave answers to support the importance and necessity of CTS. From all these findings, it can be concluded that the great majority of the participants understood the value of developing critical thinking skills and they started to exhibit those skills as specific dispositions.

The third research question aimed to find out how the students 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). Finally, the students were asked whether critical thinking skills should be taught at schools or not. Only two students stated it is not necessary to teach critical thinking skills at schools.

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 Paired Samples T-test put forward the 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, 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).

CONCLUSION

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 skills during a whole educational year. With this purpose, the data was obtained via pre and post questionnaires and structured face – to – face interviews following the courses into which the CTS were infused. 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.

As Halpern (1999) stated, it would never be adequate to teach pupils critical thinking abilities unless they have a tendency to utilize them. 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. Additionally, teachers' manner on providing students with CTS is very crucial. This study revealed one more time that modeling is of a pivotal role in teaching critical thinking.

It can be claimed that this study has contributed to 10th 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. 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 into EFL classrooms at high school level.

LIMITATIONS

Even though there were 131 participants included in this study and all the obtained data 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. Even if all the participants were at the same age and grade, individual differences and educational background of them could have complicated the instruction and assessment process. Nonetheless, an experimental design might have been preferred and suited better to see the level of development of target group; but according to the principles of equal opportunity in education, 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. Therefore, the results of the study cannot be generalized and can be considered to have an error probability.

REFERENCES

Abrami, P. C., Bernard, R. M., Borokhovski, E., Wade, A., Surkes, M. A., Tamim, R., & Zhang, D. (2008). Instructional interventions affecting critical thinking skills and dispositions: A stage 1 meta-analysis. *Review of Educational Research*, *78*(4), 1102-1134.

Akınoğlu, O. (2001). *Eleştirel düşünme becerilerini temel alan fen bilgisi öğretiminin öğrenme ürünlerine etkisi.* Unpublished Doctoral Thesis), Hacettepe University, Social Sciences Institute, Ankara.

Beaumont, J. (2010). A sequence of critical thinking tasks. *TESOL Journal*, *2010*(1), 4.

Bedir, H. (2016). Young Adolescent EFL Learners'Perspectiveson Critical Thinking Skills. *International Online Journal of Education and Teaching/ISSN: 2148-225X*, *3*(3), 229-238.

Bensley, D. A., Crowe, D. S., Bernhardt, P., Buckner, C., & Allman, A. L. (2010). Teaching and assessing critical thinking skills for argument analysis in psychology. *Teaching of Psychology*, *37*(2), 91-96.

Black, P.,& William, D. (1998). Inside the black box. *Phi Delta Kappan*, *80*(2), 139-148.

Boyles, N. N. (2002). *Teaching written response to text: Constructing quality answers to open-ended comprehension questions*. USA: Maupin House Publishing, Inc.

Chen, M. H. (2017). Integrating Thinking into L2 Learning: What do We Learn from Students' Learning Experience. *Theory and Practice in Language Studies*, *7*(7), 512.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research*, 209, 240.

Davidson, B. W. (1995). Critical thinking education faces the challenge of Japan. *Inquiry: Critical Thinking Across the Disciplines*, *14*(3), 41-53.

Dewey, J.,& Bento, J. (2009). Activating children's thinking skills (ACTS): The effects of an infusion approach to teaching thinking in primary schools. *British Journal of Educational Psychology*, *79*(2), 329-351.

Elias, M. J., & Kress, J. S. (1994). Social Decision-Making and Life Skills Development: A Critical Thinking Approach to Health Promotion in the Middle School. *Journal of School Health, 64*(2), 62-66.

Ennis, R. H. (1962). *A concept of critical thinking*. Harvard educational review.

Ennis, R. H. (1990). The extent to which critical thinking is subject-specific: Further clarification. *Educational Researcher*, *19*(4), 13-16.

Facione, N. C., & Facione, P. A. (1997). *Critical thinking assessment in nursing education programs: An aggregate data analysis.* California Academic Press.

Fisher, A. (2001). *Critical thinking: An introduction*. UK: Cambridge University Press.

Halpern, D. F. (1996). *Thinking critically about critical thinking*. Routledge.

Hullfish, H. G.,& Smith, P. G. (1961). *Reflective thinking: The method of education*. Dodd, Mead.

Karakuzular, D. (2013). *Developing critical thinking skills of EFL learners through a sequence of critical thinking tasks.* Unpublished Master Thesis, Çukurova University, Social Sciences Institute, Adana.

Kaskey-Roush, M. (2008). *How does using an integrated curriculum promote critical thinking and engagement in middle school student learning.* Unpublished Master Thesis, Ohio University, the USA.

Kitchener, R. F. (1986). *Piaget's theory of knowledge: Genetic epistemology & scientific reason*. Yale University Press.

Korkmaz, Ö. (2009). Öğretmenlerin eleştirel düşünme eğilim ve düzeyleri. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, *10*(1), 1-13.

Kow, H. M. (2016). *Infusion of Critical Thinking across the English Language Curriculum: A Multiple Case Study of Primary School In-Service Expert Teachers in Singapore.*Unpublished Doctoral Thesis, The University of Western Australia.

Kurt, A. A., & Kürüm, D. (2010). Medya okuryazarlığı ve eleştirel düşünme arasındaki ilişki: Kavramsal bir bakış. *Mehmet Akif Ersoy Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, (2), 20-34.

Kusaka, L. L.,& Robertson, M. (2006). Beyond Language: Creating Opportunities for Authentic Communication and Critical Thinking. *言語と文化*, *14*, 21-38.

Lai, E. R. (2010). *Critical thinking: A literature review.* USA: Pearson.

Legault, L., Green-Demers, I., & Pelletier, L. (2006). Why do high school students lack motivation in the classroom? Toward an understanding of academic amotivation and the role of social support. *Journal of educational psychology*, *98*(3), 567.

Liaw, M. L. (2007). Content-based reading and writing for critical thinking skills in an EFL context. *英語教學期刊*, *31*(2), 45-87.

Lin, Y. (2014). *Infusion of critical thinking into L2 classes: a case study in a Chinese high school* (Doctoral dissertation, Newcastle University).

Mahyuddin, R., Pihie, Z. A. L., Elias, H., &Konting, M. M. (2004). The incorporation of thinking skills in the school curriculum. *Kajian Malaysia*, *22*(2), 23-33.

Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning? *American psychologist*, *59*(1), 14.

McCrae, N. (2011). Nurturing critical thinking and academic freedom in the 21st century university. *International Journal of Teaching and Learning in Higher Education, 23*(1), 128-134.

McGuinness, C.,& Sheehy, N. (2006). Building thinking skills in thinking classrooms. *Teaching and learning research briefing*, *18*(1), 109-114.

MEB (2011). *Ortaöğretim kurumları İngilizce dersi öğretim programı*. Ankara: Milli Eğitim Basımevi.

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

Moran, A. (2012). Thinking in action: Some insights from cognitive sport psychology. *Thinking Skills and Creativity*, *7*(2), 85-92.

Özkan, I. (2010). A path to critical thinking. *Procedia– Social and Behavioral Sciences*, *3*, 210-212.

Paul, R & Elder, L. (2006). *The miniature guide to critical thinking: Concepts and tools.* California, CA: The Foundation for Critical Thinking.

Paul, R., Binker., A., Jensen, K., &Kreklau, H. (1990). Strategy List: 35 Dimensions of Critical Thought. Retrieved June, 16, 2013 from http://www.criticalthinking.org/pages/strategy-list-35-dimensions-of-critical-thought/466.

Paul, R.,& Elder, L. (2001). *Critical thinking: Tools for taking charge of your learning and life.*California, CA: The Foundation for Critical Thinking.

Pearlman, B. (2010). Designing new learning environments to support 21st century skills. *21st century skills: Rethinking how students learn*, 116-147.

Rafi, M. S. (2011). Promoting critical pedagogy in language education. *International Research Journal of Arts and Humanities*, *39*(39), 105.

Resnick, L. B.,& Hall, M. W. (1998). Learning organizations for sustainable education reform. *Daedalus*, *127*(4), 89-118.

Resnick, M. (2007, June). All I really need to know (about creative thinking) I learned (by studying how children learn) in kindergarten. In *Proceedings of the 6th ACM SIGCHI conference on Creativity & cognition* (pp. 1-6).ACM.

Swartz, R. J.,& Parks, S. (1994). *Infusing the Teaching of Critical and Creative Thinking into Content Instruction: A Lesson Design Handbook for the Elementary Grades*.Critical Thinking Press and Software, PO Box 448, Pacific Grove, CA 93950-0448.

Trilling, B.,&Fadel, C. (2009). *21st century learning skills*. San Francisco, CA: John.
Voogt, J.,&Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of curriculum studies*, *44*(3), 299-321.

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