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The Effects of Learning Activities on Eliminating Learners' In-Class Barriers to Critical Thinking

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ABSTRACT

Critical thinking is a skill people need to survive and succeed in today's world. Whereas it is considered crucial to teach critical thinking skills in every subject area in order to prepare students for the developing world, there are barriers to critical thinking which should be detected in order to be eliminated. Eliminating the barriers that hinder thinking critically can ease the development and implementation of critical thinking. The main purpose of this research is to determine the effect of learning activities based on the removal of critical thinking barriers on eliminating the English preparatory class students' barriers to critical thinking. In this respect, a mixed model of qualitative and quantitative research was used. A questionnaire has been developed in terms of the experimental study to determine the barriers to critical thinking which can be worked on within the classroom context and alternative activities have been developed. These activities which aimed at eliminating the barriers to critical thinking have been implemented during an 11-week period to examine their effect on removing the barriers to and developing critical thinking skills of the students. Then an interview is conducted as a case study to support the quantitative method. Although the results of the quantitative study revealed no significant statistical evidence on eliminating students' barriers to critical thinking within the 11-week period, when considered together with the qualitative analyses, the present study supports the importance of eliminating barriers to critical thinking with the support of learning activities for eliminating classroom barriers related to critical thinking.

Keywords: Barriers to Critical Thinking, Barriers to Critical Thinking Questionnaire, Critical Thinking.

Öğretim Etkinliklerinin Öğrencilerin Sınıf-İçi Eleştirel Düşünme Engellerinin Kaldırılmasına Etkisi

ÖZ

Eleştirel düşünme, insanların günümüz dünyasında hayatta kalmak ve başarılı olmak için ihtiyaç duyduğu bir beceridir. Bireyleri gelişen dünyaya hazırlamak için her konu alanında eleştirel düşünme becerilerinin öğretilmesi önemlidir. Dolayısıyla, bu beceriyi öğretebilmek için ilk etapta bu becerinin geliştirilmesine engel olabilecek eleştirel düşünme engellerinin belirlenmesi gerekir. Eleştirel düşünmeyi engelleyen engellerin ortadan kaldırılması, eleştirel düşünmenin geliştirilmesini ve uygulanmasını kolaylaştırabilir. Bu araştırmanın temel amacı, eleştirel düşünme engellerinin kaldırılmasına dayalı öğrenme etkinliklerinin İngilizce hazırlık sınıfı öğrencilerinin eleştirel düşünme engellerinin ortadan kaldırılmasına etkisini belirlemektir. Bu doğrultuda nitel ve nicel araştırmaları içeren karma model kullanılmıştır. Sınıf ortamında, üzerinde çalışılabilecek eleştirel düşünmenin önündeki engelleri belirlemek için deneysel çalışma açısından bir anket ve derslerde kullanılmak üzere öğretim etkinlikleri geliştirilmiştir. Eleştirel düşünmenin önündeki engelleri kaldırmayı amaçlayan bu etkinlikler, öğrencilerin eleştirel düşünme becerilerinin önündeki engelleri kaldırma ve geliştirme üzerindeki etkisini incelemek için 11 haftalık bir süre boyunca uygulanmıştır. Ardından nicel yöntemi desteklemek için vaka çalışması yapılmıştır. Nicel araştırmanın sonuçları, öğrencilerin eleştirel düşünmenin önündeki engellerin ortadan kaldırılmasına dair anlamlı bir istatistiksel kanıt ortaya koymasa da, nitel analizlerle birlikte değerlendirildiğinde, bu çalışma, eleştirel düşünme engellerini ortadan kaldırmaya ilişkin etkinlik kullanımının, eleştirel düşünmenin önündeki engelleri ortadan kaldırmaya yönelik önemini desteklemektedir.

Anahtar kelimeler: Eleştirel Düşünme Engelleri, Eleştirel Düşünme Engelleri Ölçeği, Eleştirel Düşünme.

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1 | INTRODUCTION

In today's rapidly developing world, besides basic information, the ways to reach more advanced information and how to use it play a significant role in the development of individuals and the society. The ability of individuals to conduct research, solve problems, think in a creative and critical way, and employ higher-order thinking are factors that can positively affect both the individual and the social development. The most important skill to possess, which is one of the important features that distinguish humans from other living things, is thinking (Dewey, 1957). Critical thinking, generally described as a high-level thinking disposition (Gheith, 2007, 8), has an important place among the types of thinking. The fact that the world is getting more and more technical and complex leads to the need for making substantial decisions. Emergence of this necessity requires critical thinking skills for the citizens of the 21st century (Dam & Volman, 2004; Garrison, 2002; Halpern, 2003; Klimoviene et al., 2006).

Critical Thinking

Critical thinking, dating back to ancient times, has gained more importance since the 1980s and its importance has gradually increased (Dam & Volman, 2004). Critical thinking, which begins with recognizing and revealing the contrast between the ideal world affairs and their present situation (Brookfield, 1997, 24), includes interpretation, analysis, evaluation, inference, explanation, self-regulation, enthusiasm, trustworthiness, openness to information and curiosity (Facione, 2011). It is the state of "thinking about thinking" to enlighten and develop the thinking process (Moore & Parker, 2009, 3). In addition, Dewey (1957) mentioned that critical thinking is the search for the accuracy of information and stated that it is realized through continuous and precise examination of all kinds of beliefs and knowledge.

Critical thinking includes being able to handle the available data correctly, question existing data in depth, and approach these data objectively without subjective comments. Therefore, asking the right question is important for critical thinking (Paul et al., 1997). According to Brookfield (1997, 4), individuals' state of questioning and asking the “why question” states an indication of their critical thinking. There are also some who define critical thinking as the reasoning process (Hirschhorn, 2008). It is also the systematic way of creating and shaping knowledge and the basic component of information literacy (D’Angelo, 2001). Critical thinking can also be explained as a self-regulated and purposeful judgment process that includes interpretation, evaluation, analysis, and inference (Giancarlo & Facione, 2001; Wessel & Williams, 2004). It is a purposeful, disciplined, understandable, detailed and reasonable process, and it shows an active, purposeful and organized cognitive feature that enables active use of intelligence, knowledge and abilities (Chaffee, 1997; Halpern, 1997).

It can be inferred that critical thinking is a skill that everyone should have and constantly improve for a quality life. It is a skill for which individuals actively use their cognition and emotions and are aware of their own cognitive processes. It includes the use of metacognitive skills such as questioning, problem solving, evaluating assumptions and analyzing, synthesizing and evaluating. Whereas Russell formulates critical thinking as “attitude + knowledge + thinking skills = critical thinking” (Halpern 2003, 7), with further consideration Critical thinking can be formulated as follows:

Critical Thinking = knowledge + intelligence + attitude + awareness + higher order thinking skills + tendency to use knowledge

Critical thinking is a skill that can be learned by everyone (Aliakbari & Sadeghdaghighi, 2013; Vong & Kaewurai, 2017). However, students cannot become critical thinkers by simply attending and listening to lectures, participating in classroom discussions, and completing standard assignments and exams (Paul, 1993). Therefore, it is not a skill that develops spontaneously over time; it requires conscious effort (Lee, 2004; Vieira et al., 2011). Apart from the importance of teaching critical thinking, it is important to evaluate the factors in the education process and to use them to carry it to success. Critical thinking is a process that must be supported by the school environment, staff, administration and students. Developing critical thinking is associated with success in teaching thinking skills, managerial support and the cohesion of student and the teaching approach as well as the program content, in-class activities and teacher training. Whereas critical thinking is an important and developable skill (Halpern, 2003; Dekker, 2020), there are some factors that keep individuals away from thinking critically and hinder their questioning process (Moore & Parker, 2009). Chaffee (1999) has mentioned that these factors are

unreasonable judgments that seem logical and that they lead individuals to make mistakes by activating their feelings and prejudices.

Barriers to Critical Thinking

According to the literature, there are different opinions and perspectives on what the critical thinking barriers are and how they are grouped. While Carroll (2004, 19) classifies barriers to critical thinking under "physical" and "emotional" dimensions, Moore and Parker (2009, 200, 229) classifies them as "emotional barriers" and "other barriers." In addition, Nosich (2012, 22, 121) focuses on barriers in terms of education and thus groups them under "educational practices" and "school-related things." In the light of the information obtained, the barriers can be classified under "individual" and "environmental" dimensions in general.

When the content of the barriers is further examined, these barriers are generally caused by the individuals' lack of experience, knowledge and questioning (Carroll, 2004; Coughlan, 2008; Dewey, 1957; Gambril, 2005; Nosich, 2012; Paul & Elder; 2006; Wood, 2002). When studies on barriers to critical thinking are reviewed through literature, it is understood that barriers to critical thinking are illusions that restrain individuals from thinking critically, and that most critical thinking barriers are problems caused by lack of knowledge or inability to use information correctly. Furthermore, the following list have been created according to the data gathered (Table 1).

Table 1. Categories of Barriers to Critical Thinking

BARRIERS TO CRITICAL THINKING					
INDIVIDUAL BARRIERS				*SOCIAL BARRIERS*	
COGNITIVE	*AFFECTIVE*	*PHYSIOLOGICAL*	*ENVIRONMENTAL BARRIERS*	*BARRIERS IN EDUCATION*	
				PROCESS	*PHYSICAL ENVIRONMENT*
Intelligence	Prejudice	Tiredness			
Memory errors	Dreams and expectations	Stress	Culture	Information transfer	Crowded classes
Illiteracy	Devotion to absolute truth	Malnutrition	Society and expectations	Rote-learning	Architectural structure
Inexperience	Indifference to new ideas and criticism	Poisoning	Rules	Content	High school walls
Perception limitations	Not being objective	Substance abuse	Prohibitions	Teacher as a source of information	Fencing outside the school, iron bars
Expression/language confusion	Socio-centric thinking	Physical defects	Pre-taught information/past		
Impulses/motives	Superstitions	Laziness	Traditions	Books as a source of information	High school walls/doors
Lack of questioning	Generalization	Genetic barriers	Beliefs	Technology	Classroom atmosphere
Misinformation/ Assumptions	Egocentrism		Stereotypes-Clichés	Insufficient material	Classroom, paint, windows, school
	Perfectionism		Dogmas	Traditional education	Classroom arrangements
	Acting without thinking		Media	Assessment procedures (exams, homework, activities, question types)	
			Worldviews		
	Fussiness		Economical power	Teacher (knowledge level, expectations, teaching method, wrong time use, knowledge-activity and theory-practice linkage; competence, guiding students, considering students.)	
	Emotional Barriers/Attitude (pride, indecision, indifference, jealousy, irritability, insistence, blame, inconsistency)		Technology		
			Conditions		
			Collective encouragement		
			Special interest groups	Institutional structure of the school	
	Making excuses		Facts	Curriculum, syllabus, lesson plan	
	Nationalism		Social pressure	Teachers and those with educational responsibilities; Staff, Administration, Students…	
			Suppression		
			Commitment to authority		

As shown in Table 1, barriers to critical thinking in educational practices can stem from any aspect of the teaching-learning process that includes the teachers, students, management, educational environment and assessment procedures as well as the approach that the process is built on. From an educational perspective, transferring knowledge (Aliakbari & Sadeghdaghighi, 2013; Onosko, 1991) and memorizing (Nosich, 2012) are important obstacles to critical thinking. The importance of instruction in critical thinking is also mentioned by Vong and Kaewurai (2017). Being passive in the classroom and not being able to ask questions (Nosich, 2012), accepting the information transferred by the teacher without questioning and taking the teacher as the only source of information are some other critical thinking barriers of the students (McKendree et al., 2002). Also, the expectations of students about school and education (Aliakbari & Sadeghdaghighi, 2013), and teachers' keeping their expectations too high or low (Onosko, 1991) can also be regarded as educational barriers to critical thinking. Thus considering the students in general, their characteristics and expectations, and attitudes towards education, process, teacher, content, etc. can be taken as a major barrier to critical thinking as also suggested by Aliakbari and Sadeghdaghighi (2013). In addition, the teachers' inability to plan their teaching time efficiently (Aliakbari & Sadeghdaghighi, 2013), their lack of content knowledge and keeping the subjects they teach too broad or limited are other educational barriers to critical thinking (Onosko, 1991).

In addition to these, teachers not being knowledgable about critical thinking (Alagözlü & Suzer, 2009; Aliakbari & Sadeghdaghighi, 2013; Chabanchi & Behrooznia, 2014; Gul et al., 2010) and/or not integrating it to their lessons (Aliakbari & Sadeghdaghighi, 2013); being incompetent, unqualified and inadequate in their major; and being disrespectful to and having a hierarchical relationship with their students also prevent critical thinking (Leming, 1998). Not taking different perspectives in the teaching process into account, not being able to relate the lessons with real life issues and having an exam-oriented teaching environment are also barriers that hinder critical thinking (Leming, 1998). Moreover, the content of the lessons (Gul et al, 2010; Nosich, 2012), curricula, and the legislation can hinder critical thinking. Crowded classrooms (Onosko, 1991), the classroom atmosphere, the physical environment that includes the row and chair arrangement in the classrooms (Gul et al, 2010) can prevent students from thinking critically, as well. In addition, exams that only focus on measuring content knowledge and expecting to have a definite answer for each question (Nosich, 2012); similarly “standardized tests and exercises (Dewey, 1957, 55),” and explicitly formulated assignments (Nosich, 2012) are other dimension of barriers to critical thinking.

Significance of the Study

As suggested by Aliakbari and Sadeghdaghighi (2013, 4), “improvements in critical thinking skills and strategies would be easier if the obstacles along the way could be removed,” in a situation where thinking, more importantly, high-level thinking, is important. Determining the barriers blocking this process and determining some action styles to overcome these barriers and seeing whether this process really benefits the development of critical thinking is a process that needs to be examined in order to develop. In this respect, the present study aims to answer the following question:

> What is the effect of learning activities in the writing lessons, which are based on removing the critical thinking barriers, on eliminating the English preparatory class students' critical thinking barriers?

2 | METHOD

Research Model

The study was conducted on a mixed model that included qualitative and quantitative methods. In the pattern used as a mixed method, firstly quantitative data were collected and qualitative data was used to support quantitative data (Büyüköztürk, et al., 2014; Fraenkel et al., 2012).

Quantitative Study

In the experimental method, "pre-test and post-test control group design" (Büyüköztürk et al., 2014, 200; Cohen et al., 2007, 276) was used. Both the experimental and control groups’ barriers to critical thinking were compared and the effect of the independent variable (activities based on removing critical thinking barriers) on the dependent variable (students' barriers to critical thinking) was investigated. The symbolic view of the experimental design with pre-test - post-test control group prepared within the scope of this study is as follows:

G1	R	O 1	X	O 2
G2	R	O 3		O 4

G1 = Experimental Group
G2 = Control Group
R = Neutrality in forming groups

O 1/O 3 = Pre-test
O 2/O 4 = Post-test
X = Independent Variable

Experimental Study Group

The experimental study group consisted of 90 students; 39 from Molecular Biology and Genetics Department, 23 from English Language and Literature Department, and 28 from Faculty of Medicine, who took compulsory English courses at the School of Foreign Languages of a state university in Turkey.

Cluster analysis was performed to divide the study group into similar and homogeneous groups and to make classifications to ensure neutrality in determining the students to be assigned to the groups (Cohen et al., 2007; Fraenkel et al., 2012). In this context, four data were used as criteria: (a) university entrance grades, (b) high school graduation averages and (c, d) two exam grades taken during fall semester. The collected grades were grouped with 4, 3 and 2 of the data groups, respectively, but enough number to form a group could not be reached. Next, the four grades (university entrance grade, high school average, exam 1, exam 2) used to make the grouping were grouped into three's, leaving one of the data out each time, and the highest result was sought. As a result of the groupings with 3 grades, the highest number of students was reached by the use of the high school grade average, exam 1 and exam 2 grades as 26 to 64 students. Due to the fact that the group with 64 was more comprehensive in number and reflected the general number more easily (Tan et al., 2006), it was decided to be used in the study. The number of students distributed to groups is given in Table 2:

Table 2: Experimental and Control Groups after Cluster Analysis

Experimental and Control Groups after Cluster Analysis			
CLASS	GROUP	NUMBER OF STUDENTS INCLUDED IN THE STUDY AFTER CLUSTER ANALYSIS	NUMBER OF STUDENTS INCLUDED IN THE STUDY AFTER MATCHING
A	Control	17	17
B	Experiment	19	16
C	Control	18	11
D	Experiment	10	7
Total Control		35	28
Total Experiment		29	23
TOTAL		64	51

As can be seen in Table 2, two classes were determined as experiment and two classes were determined as control groups. The reason for 64 students to fall to 51 after cluster analysis was that some students' pre-test and post-test results couldn't be matched, one student didn't speak Turkish and thus couldn't complete the questionnaire, and one other student was absent at the day of the questionnaire. Classes A and C, and B and D were paired considering the number of students in each group (trying to have close number of students) and the day on which these classes took their writing lessons according to the academic program. Then, as the researcher was the instructor of class B on the program determined by the administration at the beginning of the semester, the group in which this class was included - B and D classes – was the experimental group, and the other group – class A and C– was the control group.

Collection of Quantitative Data

The data of the study were collected by the “Barriers to Critical Thinking in Education Scale” developed by the researchers. The items of the scale were initially prepared as 143 items, based on the literature, covering in-class and outside-class barriers. Later, these items were reduced to 66 items after removing the items related to out-of-class barriers, assuming that the barriers which the teachers can be most effective on are the in-class barriers. Next, the items were presented to 13 experts from the field of English Language Education, Curriculum and Instruction, Measurement and Evaluation in Education, and experts who worked on critical thinking and teaching specifically. The draft scale, which was revised in line with expert opinions, took its final form as a total of 81 items, 46 of which were positive and 35 of which were negative.

After this stage, the KMO value of the scale was found to be 0.904 and the Bartlett test value was 10796.109 (Sd=1596, p<.05), which indicated that factor analysis can be carried out on the scale. Factor analysis was applied to data to reveal the dimensions of the items perceived by the respondents and to decrease the number of variables (Cohen et al., 2007; Sipahi et al., 2006). In order to perform the factor analysis, the draft scale was applied to 583 undergraduate students attending the English preparatory class at the School of Foreign Languages of three different state universities. However, two data that were found to be incomplete were removed from the system and 581 data were studied. Later, the negative 35 items in the scale were reversed in order to align them with the other items (Acock, 2008; Fairclough, 2010; Vaus, 2002). After conducting the factor analysis, the item weights were found to be at least 0.44, and the total item loads were found to represent 53,627 percent of the total variance. As a result of the factor analysis, a scale of 40 questions with six factors–16 positive and 24 negative items- was obtained. Factors and reliability coefficients of the scale were as follows: In-class process (0.898), Commitment to authority (0.7917), In-class communication (0.731), Social pressure (0.737), Self-confidence (0.629), Environmental rules (0.684).

The general reliability coefficient of the scale –Cronbach's Alpha– was found to be 0.859, showing high internal consistency. Cronbach’s Alpha value varies between 0 and 1, and it is a measure of internal consistency and reliability that shows how closely the items in the scale are related as a group (Gliem & Gliem, 2003; Santos, 1999; Tavakol & Dennick, 2011). The Cronbach's Alpha value used to measure the reliability is generally accepted to be satisfactory between 0.70 and 0.80 (Bland & Altman, 1997; Gliem & Gliem, 2003; Tappen, 2011), and when this value approaches 1, the degree of reliability is known to increase (Gliem & Gliem, 2003; Santos, 1999). Therefore, “Barriers to Critical Thinking in Education Scale” developed by the researchers can be considered as highly reliable.

Also, in order to test the usability of the scale, with the assumption that there will be an inverse relationship between barriers to critical thinking and critical thinking disposition, the "California Critical Thinking Disposition Scale" was accepted as the equivalent test, and the equivalent test, test-retest and half-test analyzes were performed. In order to find out the equivalent test correlation, 62 data pairs were made by applying the California Critical Thinking Disposition Scale to students studying at the School of Foreign Languages together with the Barriers to Critical Thinking in Education Scale. After the correlation analysis, a moderate, negative relationship (r = -625 / p <.05) was found between the "California Critical Thinking Disposition Scale" and the "Barriers to Critical Thinking in Education Scale" as expected. Moreover, to look at the test-re-test correlation, the scale was applied twice with a 17-day interval and 67 data pairs were made. As a result of the correlation analysis conducted to determine the relationship between both applications, it was concluded that there was a medium level positive relationship (r = 0.495 / p <.05) between the two applications. In addition to these analyzes, in order to increase the reliability of the "Barriers to Critical Thinking Scale", after clearing of the items discarded as a result of the factor analysis and reliability analysis, the remaining items were again numbered from 1 to 40. Then the single and double items were separated and each group’s item load average was taken. After this stage, correlations of both halves of the scale were analyzed. The result was r = 0.816 (p <.05), which showed that the reliability limit of 0.70 was exceeded (Acock, 2008; Vaus, 2002). It was concluded that both halves of the scale had a strong and positive relationship with each other.

Experimental Process

After the control and experimental groups were determined, the control groups continued the traditional, structure-based teaching process focusing on grammar, use of vocabulary and rules for academic writing parallel to the book subjects, as they did through the first semester. On the other hand, the experimental groups took lessons

according to the 11-week lesson plans prepared separately for each week that included specific activities prepared considering the barriers to critical thinking determined through the pre-tests, in line with the book subjects.

The purpose of the activities adapted or developed for each lesson as a result of the literature review in order to eliminate students' common barriers to critical thinking was to ensure active learning on the experimental students and make them understand the subject in depth, while overcoming their barriers to critical thinking through the writing lesson. The activities prepared were placed in a one-day lesson plan and prepared for each dimension of the Barriers to Critical Thinking Scale. Examples of prepared activities and other in-class practices are given in Table 3.

Table 3. Samples of Weekly Activities

	WEEKLY ACTIVITIES – SAMPLES
Week 1	Students are randomly divided into 6 groups (each with 4 students) and each group is given a different mixed paragraph. First, students are expected to put these sentences in order, individually. These students are then expected to choose the best arrangement by exchanging ideas within their groups. Next, each group's paper is collected and given to another group, and this new group's members are first expected to write the introductory and concluding sentences for the paragraph individually and then choose the best one as a group. Then, these papers are given to a third group, where necessary corrections are made individually and as a group, and the best paper is selected. Therefore, after each of the 6 papers is circulated in three groups, the group is changed again and the fourth groups are expected to grade each paragraph. Finally, the best paragraph is posted on the classroom notice board. During this process, corrections and other points that are not understood in the paragraph can be discussed with the responsible group and with the teacher when necessary. This activity enables students to; -work individually and in groups (self-confidence, in-class communication), -receive different ideas through peer-feedback. (commitment to authority, social pressure), -be comfortable with their teacher and friends. The teacher facilitates the process and assists students. There are no grades or worries of failure (in-class process).
Week 9	By bringing some news from magazines, newspapers or the internet, the following questions are asked: . What is the situation? . Why did this happen? . What if it wouldn't be like this? . What should be done to fix this situation? . What should be done to prevent this situation from recurring? Whole class is involved in the activity. The news is copied for each student, so each student will have the opportunity to examine the same news and be guided to defend their own ideas. This activity enables students to; -share their own ideas, think individually, discuss as a group/class, listen to other ideas, and compare/question their own. (self-confidence, commitment to authority) -hear different ideas/voices, and express their opinions in an environment free of grading anxiety and pressure. (in-class process, in-class communication, social pressure)
Week 11	The students select a movie that they have never watched before by voting among the options determined by the teacher and watch it. (The alternatives are chosen among the movies that haven't been watched by any of the students.) Then the students are asked to write a summary for the movie. The students' papers will be given to each other without their names written. Each student will grade their friend's paper in the light of some points and the one with the highest grade will be rewarded by hanging their work on the notice board. This activity enables students to; -consider different ideas in the stages of giving and receiving peer feedback. (in-class communication) -share ideas, write and give feedback in the classroom, and not to be under any pressure while doing these. (in-class process) - learn in a pressure-free and stress-free classroom environment where everyone is equal and not afraid of grades. (social pressure) - work individually and write by using personal perspective. (self-confidence) - study different ideas, articles and thus perspectives, and make personal arrangements accordingly. (commitment to authority)

In addition to the 11-week activity plans prepared, general criteria considering the classroom environment and the details of the process were prepared to be followed while conducting the activities and in-class practices (Table 4).

Table 4. General Criteria – In-Class Practices and Critical Thinking Barriers They Aim to Remove

In-Class Practices	Critical Thinking Barriers The Practices Aim to Remove
Students' seating arrangement will be changed every week. (In order for each student to have a chance to sit with each other.)	SELF-CONFIDENCE COMMITMENT TO AUTHORITY SOCIAL PRESSURE
Students will have a chance to attend classes with tea, coffee, etc. (Although it is forbidden in other classes.)	IN-CLASS PROCESS
Students will be free to exchange ideas with each other during the lesson.	IN-CLASS PROCESS
In each lesson, students' ideas about classroom temperature and lighting will be taken and necessary arrangements will be made as much as possible.	IN-CLASS PROCESS
Students' papers will be checked by their friends AND/OR teachers and they will receive feedback for each assignment.	IN-CLASS PROCESS IN-CLASS COMMUNICATION COMMITMENT TO AUTHORITY
Groups will be created with different students each time there is a group work. (random grouping will be done by choosing a color or number from the bag)	SELF-CONFIDENCE COMMITMENT TO AUTHORITY SOCIAL PRESSURE
A sample of each week's activity chosen by the students and/or the teacher will be posted on the notice board.	IN-CLASS PROCESS
In each lesson, different materials and topics will be used in addition to the book.	IN-CLASS PROCESS
Everyone will have an equal right to speak in the activities/during the lessons. Thus, every week notes will be taken about the students' performances within the lessons.	SOCIAL PRESSURE
Both individual and group work activities will be done every week.	SOCIAL PRESSURE IN-CLASS PROCESS IN-CLASS COMMUNICATION
Through the lessons, the teacher will be the facilitator; will be assisting the students rather than answering the questions or doing the activities.	SOCIAL PRESSURE
After students are asked a question, they will be given enough time to answer.	IN-CLASS PROCESS
When students give a wrong answer to any question, they will be given another chance together with the message that it is normal, instead of immediately switching to someone else or giving a negative reaction. If the situation continues, the teacher will then move on to another student without demoralizing the student.	SOCIAL PRESSURE
The process and attendance will be graded rather than the result. (There will be formative assessment rather than summative.)	SOCIAL PRESSURE
Students will be informed about the objectives of the activities from the very beginning.	IN-CLASS PROCESS
Each assignment given will be planned in a way that will direct students to research and it will be evaluated accordingly.	IN-CLASS PROCESS
While giving the rules about the activities, students' ideas will be taken on each rule and each rule will be shaped accordingly within the preplanned structure.	ENVIRONMENTAL RULES

Analysis of Quantitative Data

The data collected through the scale were analyzed using the SPSS program in line with the homogeneity test. Although there was normal distribution among the data collected, nonparametric tests – the Mann-WhitneyU and Wilcoxon Tests – were preferred in the study as the data were ordinal –ordered– (Demirgil, 2010) and the number of data under each group during the analysis was less than 30 –low number of samples– (Demirgil, 2010; Sipahi et al., 2006).

Qualitative Study

Qualitative data are descriptive data collected in line with the explanations and opinions of the participants and are more detailed and rich in content than quantitative studies, although they are conducted in small groups (Cohen et al., 2007; Fraenkel et al., 2012) it was made use of within the study in order to support the experimental study. In this study, "case study" design has been used in order to find out how students affected and were affected by a certain situation as the purpose of this pattern is to reveal results regarding a specific situation and understand the changes and processes that occur within a situation (Yıldırım & Şimşek, 2008). With the support of it, the opinions of English preparatory school students on critical thinking, barriers to critical thinking and the effectiveness of learning activities in writing lesson that are based on removing barriers to critical thinking were analyzed.

Qualitative Study Group

Qualitative study group consisted of students who participated in the experimental study. Since the willingness of the participants in focus group interviews is of great importance (Freitos et al., 1998; Morgan, 1997), they were determined randomly on a voluntary basis – 7 students from Class B and 5 students from class D. Thus, 12 students have been interviewed for the qualitative study. However, since the students to be included in the qualitative study were determined on voluntary basis, two of the students volunteered were from the ones not included in the experimental study.

Collection of Qualitative Data

The qualitative data of the study were collected through focus group interview. The focus group interview is a group interview process in which information is gathered on the thoughts and feelings of the participants (Freeman, 2006; Freitos et al., 1998), enabling them to speak equally (Flick, 2014). "Interview" is a holistic method of interpretation that is used to reveal people's perspectives, feelings, perceptions and experiences (Büyüköztürk et al., 2010, 161; Yıldırım & Şimşek, 2010, 40-41). The purpose of conducting the interview within the present study was to reveal the effectiveness of the activities prepared to eliminate the critical thinking barriers and to see the changes these activities have made on students. In this context, "semi-structured interview" which includes both fixed choice answering and going in depth in the relevant field (Büyüköztürk et al., 2010, 163), was used. Eight semi-structured questions (Table 5) were determined for the focus group interview by taking expert opinions, and they were directed to the students within the 90 minute interview –5 sections, 4 pieces of 20-minute and 1 piece of 10-minute recordings, all of which are decoded and archived.

Table 5. Focus Group Interview Questions

Focus Group Interview Questions
Q1: What is critical thinking?
Q2: What do you need in class in order to think critically?
Q3: What kind of circumstances would urge you to think critically? What were they in the lessons?
Q4: What do you think hinders critical thinking?
Q5: What are the barriers to critical thinking you encounter in the lessons?
Q6: Considering the barriers to critical thinking you have mentioned, how do you think each activity practiced in the lessons affected these barriers? (Each activity will be focused on separately.)
Q7: Do you believe that the activities practiced through the term supported your way of considering/evaluating topics and situations with different point of views?
Q8: Do you think there are any differences in your way of thinking considering the beginning of the semester? If yes, what kind of differences have you experienced?

Analysis of Qualitative Data

The data obtained within the scope of qualitative study were analyzed with the "content analysis" method, which enables researchers to study human behaviors indirectly through communication method (Fraenkel et al., 2012, 478), the main purpose of which is to reach the concepts and relationships that can explain the data collected (Büyüköztürk et al., 2010; Yıldırım & Şimşek, 2011). N-VIVO, a computer-aided qualitative data analysis program, was used for the purpose of theming students' comments, determining the frequencies under themes, and modeling in the analysis of the data collected through the interviews.

Research Ethics

The data collected were treated in confidence and were only reported in anonymised form. This paper doesn't require an ethics approval document as the data were collected before 2020.

3 | FINDINGS

The data analyzed for determining the effect of in-class activities specifically prepared for eliminating the English preparatory class students' barriers to critical thinking, on these students' barriers to critical thinking skills have been interpreted in line with the hypothesis.

Findings Regarding the Barriers to Critical Thinking of Experimental and Control Groups

Table 6. Experimental and Control Group Pre and Post-Tests on Barriers to Critical Thinking and Its Sub-dimensions

Experimental and Control Group Pre-Tests on Barriers to Critical Thinking and Its Sub-dimensions - Mann-WhitneyU Test					
	Pre-tests	N	Mean Rank	MWU	p-value
General Critical Thinking Barriers	Control Gr. Pretest	28	25,54	309,000	0,805
	Experimental Gr. Pretest	23	26,57		
In-class Process	Control Gr. Pretest	28	24,04	267,000	0,297
	Experimental Gr. Pretest	23	28,39		
Commitment to Authority	Control Gr. Pretest	28	28,93	240,000	0,119
	Experimental Gr. Pretest	23	22,43		

In-class Communication	Control Gr. Pretest	28	22,95	236,500	0,100
	Experimental Gr. Pretest	23	29,72		
Social Pressure	Control Gr. Pretest	28	28,79	244,000	0,138
	Experimental Gr. Pretest	23	22,61		
Self-confidence	Control Gr. Pretest	28	23,32	247,000	0,148
	Experimental Gr. Pretest	23	29,26		
Environmental Rules	Control Gr. Pretest	28	27,20	288,500	0,522
	Experimental Gr. Pretest	23	24,54		

Experimental and Control Group Post-Tests on Barriers to Critical Thinking and Its Sub-dimensions - Mann-WhitneyU Test

	Post-tests	N	Mean Rank	MWU	p-value
General Critical Thinking Barriers	Control Gr. Posttest	28	26,54	307,000	0,776
	Experimental Gr. Posttest	23	25,35		
In-class Process	Control Gr. Posttest	28	25,25	301,000	0,690
	Experimental Gr. Posttest	23	26,91		
Commitment to Authority	Control Gr. Posttest	28	27,64	276,000	0,382
	Experimental Gr. Posttest	23	24,00		
In-class Communication	Control Gr. Posttest	28	24,61	283,000	0,451
	Experimental Gr. Posttest	23	27,70		
Social Pressure	Control Gr. Posttest	28	29,13	234,500	0,097
	Experimental Gr. Posttest	23	22,20		
Self-confidence	Control Gr. Posttest	28	26,13	318,500	0,946
	Experimental Gr. Posttest	23	25,85		
Environmental Rules	Control Gr. Posttest	28	27,54	279,000	0,412
	Experimental Gr. Posttest	23	24,13		

When the post-tests of control and experimental groups are considered in terms of general and sub-dimension barriers to critical thinking, no significant difference was found between the two groups ($p = 0.05$). However, some additional findings are observed as a result of detailed analyses between pre-test and post-test comparisons. Considering the relationships between pre-tests and post-tests with the scope of the data obtained in the findings are as follows: There is a decrease in the "commitment to authority" barrier of the control group, and an increase in the “social pressure” barrier both of which were high in the pre-test; "social pressure" factor increased, and the "environmental rules" barrier remained the same. However, all three are found to be higher than the experimental group results. When the experimental group is considered, a decrease is found in each "in-class process," "in-class communication," and "self-confidence;""self-confidence" barriers higher in the post-test result of the control group when compared with the experimental group. On the other hand, when the "general critical thinking" barriers data are considered, a decrease in favor of the experimental group is found between the pre-test and post-test comparisons; while the general critical thinking barriers of the experimental group are higher in the pre-test, that of the control group is higher than the experimental group in the post-test. Therefore, it can be claimed that the experimental process carried out reduced the critical thinking barriers, though not significantly.

Pre and Post-Test Findings of Experimental Group Regarding Barriers to Critical Thinking

Table 7. Pre and Post-Tests of Experimental Group on Barriers to Critical Thinking and its Sub-dimensions

Pre and Post-Tests of Experimental Group on Barriers to Critical Thinking and its Sub-dimensions - Wilcoxon Test

	Tests	N	Mean Rank	WILCOXON(Z)	p-value
General Critical Thinking Barriers	Experimental Gr. Posttest – Pretest	Neg. 12a Pos. 10b Ties 1c Total 23	13,71 8,85	-1,235a	0,217
In-class Process	Experimental Gr. Posttest – Pretest	Neg.10a Pos. 13b Ties 0c Total 23	14,45 10,12	-,198a	0,843
Commitment to Authority	Experimental Gr. Posttest – Pretest	Neg. 11a Pos. 12b Ties 0c Total 23	12,14 11,88	-,137b	0,891
In-class Communication	Experimental Gr. Posttest – Pretest	Neg. 12a Pos. 6b Ties 5c Total 23	9,33 9.83	-1,180a	0,238
Social Pressure	Experimental Gr. Posttest – Pretest	Neg. 10a Pos. 13b Ties 0c Total 23	15,20 9,54	-,430a	0,667
Self-confidence	Experimental Gr. Posttest – Pretest	Neg. 11a Pos. 10b Ties 2c	11,82 10,10	-,508a	0,612

		Total 23			
Environmental Rules	Experimental Gr. Posttest – Pretest	Neg. 13a Pos. 7b Ties 3c Total 23	10,92 9,71	-1,395a	0,163

a. posttest value<pretest value
b. posttest value > pretest value
c. posttest value = pretest value

Within the scope of barriers to critical thinking and its sub-dimensions, the result of the pre- and post-test evaluation analysis of the experimental group does not show any significant difference between the pre-test and the post-test. As a result of the detailed rank value averages examinations, the following conclusions can be reached: There is an increase in the "in-class process", "commitment to authority" and "social pressure" barriers of the experimental group participants, and a decrease in their "in-class communication," "self-confidence" and "environmental rules" barriers as well as the "general barriers to critical thinking" factor. The barriers that have increased are the ones that are dependent on others, external factors; therefore, the reason behind not overcoming these barriers can be attributed to lack of extracurricular activities.

Pre and Post-Test Findings of Control Group Regarding Barriers to Critical Thinking

Table 8. Pre and Post-Tests of Control Group on Barriers to Critical Thinking and its Sub-dimensions

Pre and Post-Tests of Control Group on Barriers to Critical Thinking and its Sub-dimensions - Wilcoxon Test					
	Tests	N	Mean Rank	WILCOXON(Z)	p-value
General Critical Thinking Barriers	Control Group Posttest –Pretest	Neg. 16a Pos. 12b Ties 0c Total 28	12,91 16,63	-,080a	0,936
In-class Process	Control Group Posttest –Pretest	Neg.15a Pos. 13b Ties 0c Total 28	12,87 16,38	-,228b	0,820
Commitment to Authority	Control Group Posttest –Pretest	Neg. 15a Pos. 13b Ties 0c Total 28	13,97 15,12	-,148a	0,882
In-class Communication	Control Group Posttest –Pretest	Neg. 9a Pos. 10b Ties 9c Total 28	10,61 9,45	-,020a	0,984
Social Pressure	Control Group Posttest –Pretest	Neg. 17a Pos. 11b Ties 0c Total 28	15,82 12,45	-1,518a	0,129
Self-confidence	Control Group Posttest –Pretest	Neg. 8a Pos. 19b Ties 1c Total 28	13,88 14,05	-1,897b	0,058
Environmental Rules	Control Group Posttest –Pretest	Neg. 14a Pos. 10b Ties 4c Total 28	14,64 9,50	-1,582a	0,114

a. posttest value < pretest value
b. posttest value > pretest value
c. posttest value = pretest value

The statistical comparison between the pre and post tests of control group, as a result of the traditional training, showed no significant difference at the $p \leq 0.05$ significance level. Considering the rank values, following the 11-week traditional training process of the control group participants, the "in-class communication" barrier increased as well as the "self-confidence" barrier. In addition, there has been a decrease in the "in-class process," "commitment to authority," "social pressure" and "environmental rules." Moreover, there was a decrease in the "general barriers to critical thinking" factor of the participants. Based on the findings, it can be claimed that traditional education negatively affects the barriers concerning self-confidence as well as in-class communication of the individuals.

Findings Regarding the Effectiveness of Learning Activities Based on the Elimination of the Barriers to Critical Thinking

As a result of the focus group interview, under the comments made by the participants on "critical thinking," "barriers to critical thinking" and "the effects of the experimental study on removing the barriers to critical thinking," three main themes emerged: "the effects of the experimental study in removing the barriers to critical thinking,""the sources of the barriers to critical thinking," and "the requirements for critical thinking." The three themes and their sub-topics are as follows:

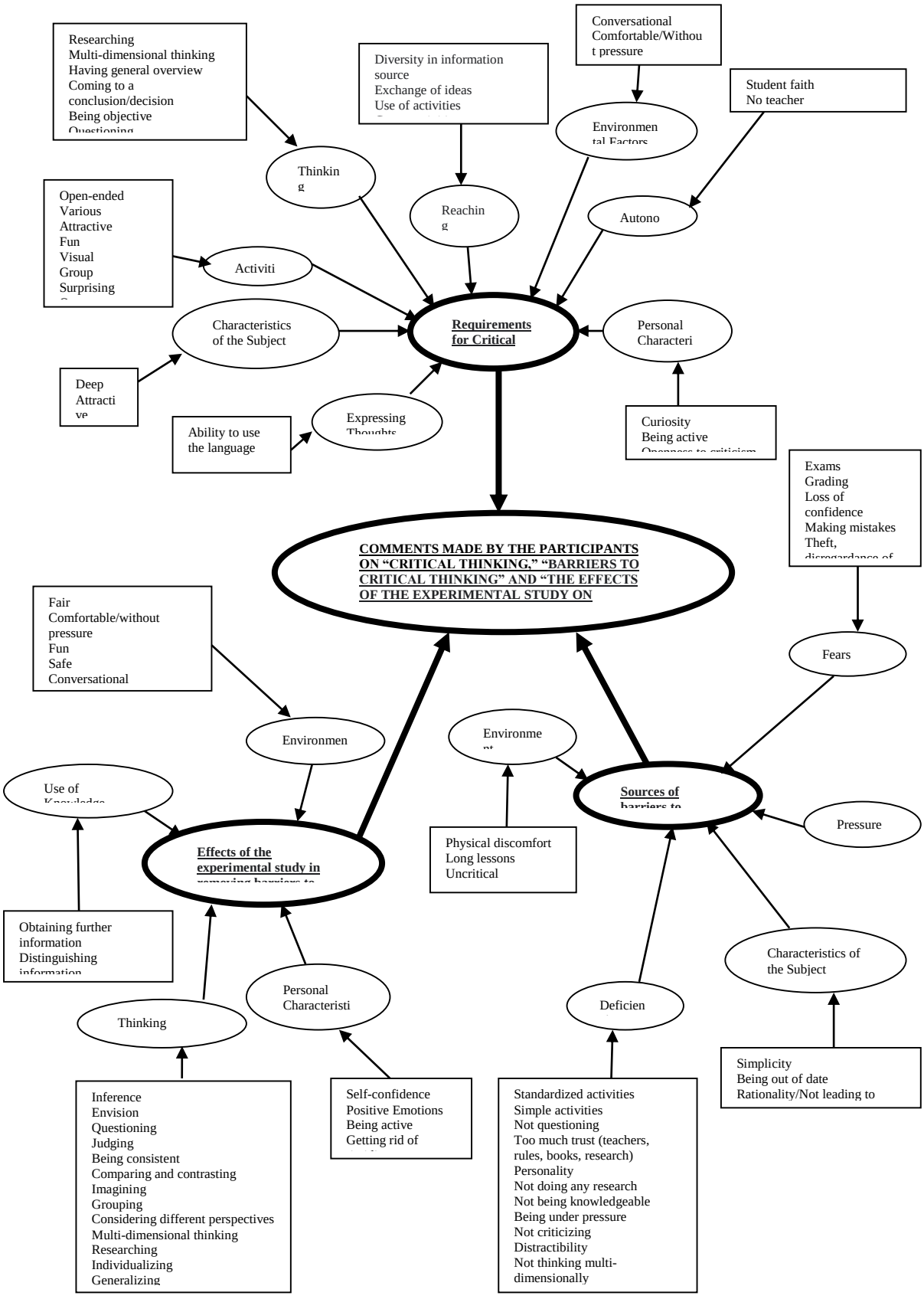

Figure 1: *Focus Group Interview Themes and Sub-themes*

Under the theme of "Requirements for critical thinking," the ideas the participants mostly pointed out are; *Reaching knowledge* (F = 20) through *student interaction* (F = 10) and *exchange of ideas* (F = 14); *use of activities* (F = 19), especially *group activities* (F = 5); and *thinking strategies* (F = 19) including *multi-dimensional thinking* (F = 7). Next, under the theme of "Source of barriers to critical thinking," the points that were especially emphasized were; *deficiencies* (F = 52) including *not questioning* (F=17), *too much trust* (F=11), *not being knowledgeable* (F=10) and *not doing any research* (F=8);*fears* (F = 13), especially on *being ignored* (F = 5); and *being under pressure*(F = 12).Lastly, when the "Effects of the activities used in the experimental study for removing the barriers to critical thinking" were considered, the answers revealed that the participants have developed on the following: *Thinking strategies* (F=68) including *evaluating different perspectives* (F=23), *multi-dimensional thinking* (F=12),*group thinking* (F=11), *questioning* (F=10) and *self-awareness* (F=9);and *self-confidence* (F = 16)in *expressing opinions* (F = 11); and *personal characteristics* (F = 58)especially in the context of affecting *emotions* (F=39) related to *respect for differences* (F = 11).In addition to these, it was pointed out that *acquiring new and different information* (F=16) is quite effective in *information use* (F = 20) and that environment that is *entertaining* (F=9),*free of pressure* (F=9) and *suitable for integration* (F=9) are the most prominent features of the *environment* (F=29) factor.

The data obtained revealed that the activities made students gain awareness, questioning skills and research skills, and desire and need for detailed thinking, as well as making them learn how to express their ideas with self-confidence; as a group and by respecting each other.

4 | DISCUSSION & CONCLUSION

In order to think critically, identifying and eliminating the barriers that hinder it is an important step. Therefore, the results of the study have been conducted in this direction and discussed together with the literature:

At the end of the experimental process, it was determined that the barriers to critical thinking of both the experimental and control group participants regressed. Although there was a regression in the barriers of both groups, the barriers of the control group were found to be slightly higher than the experimental group. Elimination of the barriers to critical thinking takes place through the use of strategies used in education and critical thinking strategies used in activities (Vieira et al., 2011). It is necessary to encourage students to think and question, while avoiding traditional activities and training including repetition, rote learning, and memorization as they inhibit reasoning and critical thinking (Halpern, 1997). At this point, it can be concluded that the 11-week experimental study process aimed at removing the barriers to critical thinking was a right step towards eliminating the barriers to critical thinking on the experimental group.

As a result of the barriers to critical thinking pre and post statistical comparison of the experimental group, the in-class process as well as the authority and societal barriers, that can be considered as barriers related to external commitment, were found to be problematic and these barriers increased even more in the 11-week period. Considering that these barriers are characteristics that will be affected by the general upbringing processes of individuals, the intensity and manner of including critical thinking in other subjects, and extracurricular activities, it is understandable that these barriers cannot be overcome. According to Pogrow (1998) a problematic situation of external commitment barriers can be due to the most high-level thinking activities being independent from classroom activities. Thus, directing students to extracurricular social and cultural activities would develop critical thinking (Aybek, 2006; Li & Zhang, 2013). Similarly, Shcheglova et al. (2019) suggested that academic, research and extracurricular engagement of individuals are positively associated with critical thinking skills. Therefore, it can be concluded that extracurricular activities would be effective in eliminating students' out-of-class barriers.

As a result of the experimental study, although there were no significant differences, results were obtained in favor of the experimental group. This situation can be attributed to some reasons. The 11-week training that the participants were exposed to can be inadequate. Critical thinking is more effective when it is used beginning from an early age. Although it has certain effect as the age progresses, its development decreases (Dewey, 1957; Thompson, 2011); and it requires rather long time for teaching it (Baker & Rudd, 2001; Chabanchi & Behrooznia, 2014; Coughlan, 2008; Fell & Lukianova, 2015; Moon, 2008, 95; Pogrow, 1988; Shor, 1980). The present study lasted 11 weeks and 4 hours a week; such an education should be planned in earlier years and for a longer period in order to obtain more effective results (Akbıyık & Seferoğlu, 2006). Similarly, according to some research results, critical thinking is an important goal that should start from primary education and continue until university,

but university education alone has little effect on making students creative and critical thinkers (Baker and Rudd, 2001). Also, the present study was done only within the scope of writing. The need for similar activities to be included in the whole education process (Gibson, 1995; Gul et al, 2010; Vong & Kaewurai, 2017) within multiplicity of disciplines (Dekker, 2020) and even to be used in other areas of individuals' lives (Pogrow, 1988) is another limitation of the study. Also, in addition to the writing course, which can be considered as a way of expressing the knowledge that students have acquired, directing students to critical thinking in "reading," "listening," "speaking" and "grammar" lessons is a practice that would support them to learn and internalize this skill better. Ultimately, for critical thinking to be successful, it is important that not a single course, but the entire educational process is planned accordingly (Baker & Rudd, 2001), and that it requires a certain time to be successful in learning and internalizing it.

When the control group data were examined, it was determined that the participants' self-confidence barriers increased as a result of the ongoing education process. When examining the status of other barriers, it was decided that although some barriers had dropped, none of them were significant. In short, it can be concluded that traditional, structure-based teaching process focusing on grammar, use of vocabulary and rules does not have any positive effects on lowering participants' barriers to critical thinking. Therefore, it can be interpreted as being insufficient to make individuals critical thinkers, and to remove their critical thinking barriers, and the education system should be reorganized according to today's conditions and requirements, according to the needs of students and society (Dam & Volman, 2004; Garrison, 2002). Besides, there is a need of educating individuals to think critically (Dekker, 2020; Gul et al., 2010; Vong & Kaewurai, 2017; Wilson, 2016) and this is one of the main objectives of education, which at the same time would mean supporting individuals to reduce and/or eliminate their barriers to critical thinking.

The data collected as a result of the interviews have provided some clues about the participants' critical thinking, barriers to critical thinking and the effect of the activities on eliminating these barriers. Firstly, when the opinions of the participants on "critical thinking and its requirements" are considered, it is noteworthy that the participants especially emphasized group work activities, communication, information exchange through activities, and multi-dimensional thinking by evaluating different perspectives and possibilities. Developing different perspectives, being open to alternatives and considering new values are among the values that individuals should use while thinking critically. Halpern (2003) also emphasized the need for critical thinkers to be good at communication and consensus.

Besides, the importance of class discussions, panels, group projects and other similar active learning activities that include multi-dimensional thinking and group work, in developing critical thinking has been demonstrated by various researchers (Gibson, 1995; Vieira et al., 2011). Similarly, the importance of individuals' involvement in collaborative work in terms of developing critical thinking has been emphasized (Huang et al, 2017; Klimoviene et al., 2006; Smith, 1990; Swartz, 2002, 73).

The comments made by the participants on "barriers to critical thinking" reveal that barriers to critical thinking are mostly caused by fears, social pressure, and thinking deficiencies. It is also stated in the literature that pressure, fear and thinking deficiencies are among the barriers to critical thinking. "Fear" is a condition that can be discussed under the heading of emotion, causing individuals to be distracted and unable to think rationally (Chaffee, 1999, 513; Moore & Parker, 2009, 200; Nosich, 2012, 22). "Social pressure/impact" is the conscious or unconscious orientation of individuals by the environment which results in individuals' inability to question as they can't do or don't prefer to (Dewey, 1957, 14; Ennis, 1996, 57; Moore & Parker, 2009, 200; Sarıgül, 2005, 39; Shor, 1980, 241). Therefore, "thinking deficiencies" is a situation that keeps individuals away from questioning due to their experiences and lack of knowledge (Carrol, 2004, 12; Gambril, 2005, 499; Paul & Elder, 2006, 4; Sarıgül, 2005, 38).

Finally, the participants' comments on "the effect of the activities for eliminating the barriers to critical thinking" were discussed. As a result of the comments, the participants claimed the activities to be good for the following: Directing individuals to questioning, research and raising awareness; developing desire and need to think in detail; enabling individuals to act with the group, to respect others and to take different people and ideas into consideration; developing self-confidence; and giving comfort of expressing one's ideas. When the effects

stated by the participants are examined, it is seen that the obtained effects are among the critical thinking characteristics. Each of "questioning" (Aybek, 2007, 10; Brookfield, 1997, 7-9; D'Angelo, 2001, 308), “self-confidence / ease of expressing ideas” (Brookfield, 1997, 114; Paul et al., 1990, 59-61; Zhang, 2003, 517), "respecting the other" (Akınoğlu, 2003, 16; Brookfield, 1997, 114; Chaffee, 1997, 62; Coughlan, 2008, 8-9; Norris, 1985, 40); “awareness” (Chaffee, 1996, 47; Coughlan, 2008, 8-9; Cüceloğlu, 1994, 216; Halpern, 1997, 5; Moore & Parker, 2009, 3; Reed, 1998, 91), and “ research ”(Brookfield, 1997, 7-9; Zhang, 2003, 517), and “taking action with the group (collaborative work)” (Huang et al, 2017, 214; Klimoviene et al., 2006, 82; Swartz, 2002, 73) that participants claim to have developed in them are needed in critical thinking.

As a result, although the process aimed at removing the barriers to critical thinking was not statistically significant, considering the further statistical analyses and the interview conducted, it can be concluded that the process of integrating critical thinking activities evoked positive tendency in students towards eliminating the obstacles before critical thinking. This shows that the only thing that can remove the problems in front of thinking is again thinking. Therefore, determining the barriers in front of critical thinking and then determining the appropriate actions to overcome these barriers can be claimed to be beneficial in the development of critical thinking skills.

The current study which aimed at removing the barriers to critical thinking fills a gap in the literature by bringing in a questionnaire to reveal individuals’ barriers to critical thinking that can be worked on within in-class process, and it can also be taken as a good starting point for future studies in terms of developing critical thinking skills in individuals.

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Declaration of Conflict of Interest

This study does not have any conflict of interest.

Researchers’ Contribution Rate

Authors	Literature review	Method	Data Collection	Data Analysis	Results	Conclusion
Özlem Miraç Özkaya	☒	☒	☒	☒	☒	☒
Nuriye Semerci	☐	☒	☐	☒	☐	☐

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APPENDIX-1

Critical Thinking Barriers Scale

Rate your level of agreement with each statement by marking the most appropriate choice. **1 (Strongly Disagree) ---------- 5 (Strongly Agree)**	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly Agree**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
1. I obey the classroom rules without questioning.					
2. I cannot express myself in the lesson as I am afraid of making mistakes.					
3. I cannot think efficiently within stressful classroom environment.					
4. The teacher's positive reinforcement supports my thinking.					
5. I am open to new ideas.					
6. Being able to ask questions in the classroom comfortably supports my thinking.					
7. The teacher giving hints about the questions asked in the lessons supports my thinking.					
8. Effective lessons (student-centered, active, etc.) support my thinking..					
9. I cannot think when I feel the pressure of my friends.					
10. Being ridiculed in the classroom effects my thinking negatively.					
11. I am open to innovations.					
12. Effective use of time (having enough time to ask and answer questions, etc.) supports my thinking.					
13. Feeling safe in the classroom supports my thinking.					
14. I am curious about new facts.					
15. I accept new ideas without questioning.					
16. I don't question my teachers.					
17. The teacher's teaching style (variety of techniques, activities, way of teaching, questioning, etc.) supports my thinking.					
18. The teacher's expectations support my thinking.					
19. The teacher giving me right to speak supports my thinking.					
20. Feeling comfortable in the classroom supports my thinking.					
21. I cannot think when I feel my teacher's pressure.					
22. I agree with what the majority says.					
23. I can defend my ideas.					
24. I support my friend's ideas without questioning.					
25. I question the data I come across in order to reach the right information while doing extracurricular activities such as homework, projects, educational activities, etc.					

26. Being informed about the objectives of the courses supports my thinking.					
27. Feeling free in the classroom supports my thinking.					
28. Teacher's feedback in the lessons (informing the student about his/her success, level and failure) supports my thinking.					
29. My friends' attitudes towards me supports my thinking.					
30. Thinking process bores me.					
31. I obey the rules in the environments I am in without questioning.					
32. I support my friend's actions without questioning.					
33. The teacher's behaving according to student psychology eases my thinking.					
34. I am afraid of being ignorant among others.					
35. Knowledge of teachers on the subjects supports my thinking.					
36. Appropriateness of classroom lighting supports my thinking.					
37. I am a sociable person.					
38. I try to be informed about the topics that are important to me.					
39. I don't consider ideas other than my own.					
40. I obey the school rules without questioning.					