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Critical Thinking and Emotional Intelligence: Investigating the Relationship among EFL Learners and the Contribution of Age and Gender

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Abstract

The present article, first, examines the relationship between EFL university students' critical thinking (CT) and emotional intelligence (EI). Second, the roles of gender and age as moderating factors in the relationship between students' CT and EI are investigated. Third, the relationships between students' age and gender with their EI are studied. To attain the goals of the research, 86 EFL students completed the "Watson-Glaser Critical Thinking Appraisal" (Form A) and the "Bar-On's EQ-i test". The findings of the study indicated that there was a significant relationship between EFL learners' CT and their EI. Among the components of EI, *flexibility* and *social responsibility* were found to have the highest correlations with CT and were also shown to be positive predictors of CT. The results also revealed that age and gender did not moderate the relationship between CT and EI. Furthermore, it was found that neither age nor gender played any significant roles in learners' level of EQ.

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Introduction

A primary objective of education is to prepare individuals to be effective learners. This means helping them develop the functional, emotional and metacognitive knowledge needed (Jarvis, 2005). From the perspective of educational psychology, existing psychological paradigms present diverse visions of the nature of the learner, including the learner as cognitive being, emotional being, or socially constructed being. To be an effective learner, as Jarvis (2005) contended, entails adopting an eclectic position and developing an adequate level of each paradigm. In other words, learners need to incorporate and maintain equilibrium among cognitive, emotional and social aspects of any learning endeavor. The focus of the present study is on the higher-order dimensions of cognitive and emotional facets: critical thinking (CT) and emotional intelligence (EI). A substantial theoretical and empirical base now exists in the literature to demonstrate the association of each of these constructs with academic success. For instance, research indicates that emotional skills are associated with success in many areas, including effective teaching, student learning, and academic performance (Brackett & Salovey, 2004; Ghanizadeh & Moafian, 2010; Mayer, Salovey & Caruso, 2004; Sutton & Wheately, 2003). Likewise, CT has recently received considerable research interest in the field of education and psychology. In educational setting, it is widely accepted that learning to think is one of the most important goals of formal schooling. Dewey (1933) stated that the central purpose of education is learning to think. As part of that education, learners need to develop and learn to apply CT skills to their academic studies effectively (Kealey, Holland & Watson, 2005). Investigating the existing theoretical contentions on CT and EI led the researchers of the present study to postulate a reciprocal association between these two constructs. Historically, Paul (1987) argued that "emotions and beliefs are always inseparably welded together" (p.142, cited in Moon, 2008). In a similar vein, Brookfield (1987) contended that personal emotion is central to CT. Alternatively, Elder (1996) maintained CT is the key to EI. She believed that "CT is the only plausible vehicle by which we could bring intelligence to bear upon our emotional life" (p. 5).

What was mentioned, nevertheless, is all founded on theoretical contentions and logical reasoning and no study to date has empirically investigated the relationship

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between EI and CT in an L2 context. This gap in the field calls for investigations to examine the relationship between EFL learners' CT and EI.

Literature Review

Review of the Literature on EQ

The definitions of EI.

EI can be broadly defined as "the ability to understand and manage emotions" (Barchard & Hakstian, 2004, p. 438). Salovey and Mayer (1990) considered EI as "a set of skills hypothesized to contribute to the accurate appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life" (p.185). Therefore, EI is an umbrella term encompassing a wide collection of interpersonal and intrapersonal skills. The ability to comprehend the feelings of others, create and retain interpersonal relationships and, most importantly, our sense of social responsibility comprises interpersonal skills, and the ability to recognize and realize one's own motivations and emotions composes intrapersonal skills (Katyal & Awasthi, 2005). To measure EI from this perspective, a skill-based model conceptualizing EI as a set of abilities irrespective of personality traits or preferred ways of behaving was proposed. The proponents of the ability models of EI contended that measures of EI should be performance tests constrained to a set of emotion-related skills.

Other definitions and models of EI conceptualize it as a mixed set of perceived abilities, skills, and personality traits. Goleman (1998), a pioneer in the field, defined EI as "the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationship" (p. 317). To assess EI from this perspective, the mixed models utilized self-report measures incorporating an array of perceived abilities and traits. Bar-On (2000), the designer of the world's mostly-used mixed measure of EI, viewed EI a collection of capabilities, competencies and non cognitive skills that have an effect on a person's abilities to gain success in the face of environmental pressures. In other words, he believed that EI was the ability to understand emotions and how such emotions influence interpersonal relationships.

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The Bar-On's model of EI.

A stated earlier, one of the most popular measurement tools derived from mixed approach is the one designed by Bar-on. He coined the term 'emotional quotient' (EQ) for his measure. According to the Bar-On's model of EI, EI is an integration of interconnected emotional and social competencies and skills determining how successfully we comprehend and convey ourselves, realize others and communicate with them, and deal with daily necessities and problems. The emotional and social competencies and skills in this conceptualization include the five key constructs and each of these constructs consists of a number of closely associated components as follows: (1) Intrapersonal (Self-Regard, Emotional Self Awareness, Assertiveness, Independence and Self- Actualization), (2) Interpersonal (Empathy, Social Responsibility and Interpersonal Relationship), (3) Stress Management (Stress Tolerance and Impulse Control), (4) Adaptability (Reality Testing, Flexibility and Problem Solving), and (5) General Mood (Optimism and Happiness) (Bar-On, 2006).

EI, gender, and age.

Traditional beliefs and stereotypes have conclusively suggested that women are better at expressing their emotions and are more emotionally aware, so possess higher levels of EQ. A review of the literature on the relationship between gender and EQ reveals that the majority of these studies substantiate the widely held view that females are emotionally more intelligent than males. For instance, Perry, Ball and Stacey (2004) pointed out that females reported higher EI than did male. In a similar vein, Day and Carroll's (2004) study indicated that females scored significantly higher than did men on overall EI.

In contrast, previous research investigating the relationship between gender and EQ demonstrates that that the issue of age differences in EQ has remained an area of controversy among researchers. Goleman (1995) and Bar-On (2006) maintained that EQ is acquired and nurtured through repeated exposure and experience over time. Atkins and Stough (2005) and Perry, Ball and Stacey (2004) found no significant age effects for overall EI. In contrast, Penrose, Perry and Ball (2007) noted that older teachers and females had higher levels of EI than younger male teachers although the difference was relatively small in magnitude. A recent study conducted by Gahnizadeh and Moafian (2010) demonstrated identical results with EFL teachers.

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Review of the Literature on CT

Definitions of CT.

The literature related to CT reveals that there are a multitude of definitions for what constitutes CT. Historically, Dewey (1933) described CT from a philosophical perspective whereby education was meant to provide conditions to cultivate habits or training of the mind. More recently, CT has been viewed as consisting higher-order thinking skills. Halpern (2003), for instance, defined critical thinking as the kind of thinking that is "purposeful, reasoned, and goal-directed and the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions" (p. 6). In his view, CT comprises the following skills: verbal-reasoning skills; argument-analysis skills; thinking skills such as hypothesis testing; decision-making and problem-solving skills (Halpern, 1998). CT was defined by the American Philosophical Association Project as purposeful and self-regulatory judgment which results in interpretation, analysis, evaluation and inference and is founded on the conceptual criteria upon which a judgment is based (Facione & Facione, 1996). Watson and Glaser (2002) associated CT with the following abilities:

> inferences drawn from factual statements; recognition of assumptions in a series of statements; interpreting whether conclusions are warranted or not; determine if conclusions follow from information in given statements, and evaluating arguments as being strong and relevant or weak and irrelevant (pp. 21–23).

Areas of CT influence.

CT has been long viewed as a skill for a lifetime of complicate choices which individuals have to make in their personal, academic and social lives. In this fast-paced and ever-changing world we live in, CT is not a mere luxury; it has been considered by many scholars a basic survival skill (Facione & Facione, 1996; Wright, 2002; Moon, 2008). Philosophers of education contend that CT is the fundamental goal of learning and central to higher education (Paul, 1987; Ennis, 1996). Although course objectives may vary from discipline to discipline, CT skills have been found to be consistently required to meet all academic objectives (Facione, 2010). In L2 context, more recently, ways in which CT might be interpreted and taught have become highly debated questions for L2 learning

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scholars and practitioners (Thompson, 2002). A shift has occurred from viewing learning primarily as rote training to conceptualizing learning as a constantly evolving process of discovering, questioning, and reformulating hypotheses (Pennycook, 1994).

CT skills have also recently gained attention in research related to EFL students' and teachers' attitudes and achievement and a diverse body of educational research reported the importance of promoting higher-order thinking skills and the positive influence of CT on learners' and teachers' performance in EFL contexts (e.g., Birjandi & Bagherkazemi, 2010; Davidson & Dunham, 1997; MacBride & Bonnette, 1995) and the association of CT with other affective, cognitive, and metacognitive skills (Rouhani, 2008; Ghanizadeh, 2011).

Due to the pivotal role of learners' CT abilities in academic success, it seems crucial to explore the factors that might have relationship with it. Based on the theoretical contentions stated earlier (Brookfield, 1987; Elder, 1996; Moon, 2008), EI appears to be one of the constructs associated with CT. To empirically examine this assumption, endeavor was made in the present study to investigate the possible relationship between EFL learners' CT abilities and their EI skills. To this end, the following primary and secondary research questions were posed and investigated in this study:

Primary research questions:
1) Is there any significant relationship between EFL learners' CT and EQ?
2) Among the components of EFL learners' EQ which one(s) is/are a positive predictor of their CT?
3) Is the relationship between EFL learners' CT and EQ moderated by gender?
4) Is the relationship between EFL learners' CT and EQ moderated by age?

Secondary research questions:
1) Is there any significance difference between females and males regarding their EQ?
2) Is there any relationship between EFL learners' EQ and their age?

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Method

Participants

Eighty five Iranian EFL learners participated in this study. There were 51 females and 23 males; 11 participants did not specify their gender. Their age varied from 20 to 31 years old (M = 22, SD = 2.14); 15 participants did not specify their age. They were sophomores, seniors and juniors who were studying English Literature, English Teaching and English Translation at Mazandaran, Binaloud and Ferdowsi universities and Azad universities of Mashhad, Tehran and Quchan.

Instruments

Watson-Glaser's critical thinking appraisal (form A).

To evaluate teachers' CT ability, the "Watson-Glaser Critical Thinking Appraisal" (CTA) (Form A) was employed. This test comprises 80 items and consists of 5 subtests as follows (Hajjarian, 2008, pp. 87-88):

Table 1
The subtests of CTA along with the corresponding descriptions

Subtest	Description
Test 1. *Inference*	Discriminating among degrees of truth or falsity of inference drawn from given data.
Test 2. *Recognizing Unstated Assumptions*	Recognizing unstated assumptions or presuppositions in given statements or assertions.
Test 3. *Deduction*	Determining whether certain conclusions necessarily follow from information in given statement or premises.
Test 4. *Interpretation*	Weighing evidence and deciding if generalizations or conclusions based on the given data are warranted.
Test 5. *Evaluation of Arguments*	Evaluation of Arguments: Distinguishing between arguments that are strong and relevant and those that are weak or relevant to a particular question at issue.

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Reliability of the Watson-Glazer test has been determined in three ways. Estimates of the test's internal consistency, stability of the test scores over time and the correlation between scores on alternate forms. Internal consistency was measured using split-half reliability coefficients using the Spearman-Brown formula. Testing stability over time, by administrating the test to the same group with an interval difference, indicate an acceptable level of stability (0.73). Regarding validity, the Watson-Glaser test enjoys all areas of face, content, criterion and construction validity (Hajjarian, 2008).

In the present study, the Persian version of the Watson-Glaser test was applied. According to Mohammadyari (2002), this test and its subscales do have reliability and validity in Iranian culture. To analyze the reliability of the questionnaire, she utilized split-half reliability estimate. With the adapted version in Iran, the reliability was found to be 0.98 and the results of the factor analysis provided some support for the inventory hypothesized structure (Mohammadyari, 2002). In present study, the total reliability of the questionnaire, calculated via Cronbach' alpha, was found to be 0.61.

EQ test.

To evaluate language teachers' EI, the researchers employed "Bar-On EQ-i test" which was designed by Bar-On in 1980. Bar-On EI test, called the emotional quotient inventory (EQ-i), is a self report measure of emotionally and socially intelligent behavior that provides an estimate of emotional-social intelligence (Bar-On, 1997). The test includes 133 items in the form of short sentences which measures five broad areas of skills and fifteen factorial components (discussed in Bar-On's model). It employs a five-point response scale with a textual response format ranging from 'very seldom' or 'not true of me' to 'very often' or 'true of me'. Each item has the value of 5 ranging to 1. In the present study, a Persian version of EQ test was applied. According to Dehshiri (2003), this test and its subscales do have reliability and validity in Iranian culture. As he states, the questionnaire has generally good internal consistency, test-retest reliability, and construct validity. With the adapted version in Iran, the Cronbach's alpha coefficient was found to be 0.76 and the results of the factor analysis provided some support for the inventory hypothesized structure (Dehshiri, 2003). In this study, the total reliability of the questionnaire, estimated via Cronbach' alpha, was 0.81.

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Data Collection

The study was conducted in several universities (Mazandaran University, Ferdowsi University, Binaloud University, Azad University of Tehran, Azad University of Mashhad and Azad University of Quchan) in Babolsar, Mashhad, Tehran and Quchan- four different cities in Iran, between May 2009 and January 2010. The participants were asked to take the Bar-On's EQ-i test and the Watson-Glaser Critical Thinking Appraisal. They took the questionnaires home, filled them in and during the following weeks submitted them to the researchers or their friends who were in charge of data collection. To receive the reliable data, the objective of filling out the questionnaires was explained to the subjects and they were assured that endevor would be made to observe the confidentiality and anonymity considerations. Besides, the participants' questionnaires were coded numerically and they were asked not to write a name on their questionnaires

Data Analysis

Primary research questions.

To ensure the normality of the distribution, descriptive statistics was employed. To determine the relationship between learners' EQ and their CT, a Pearson product–moment correlation was applied to the data. To discover if there was any relationship between any of the 15 different components of EQ and learners' CT scores, a Pearson Product-Moment correlation was run. To find out which components of EQ might have more predictive power in predicting learners' CT, a stepwise regression analysis was run. To determine the role of gender and age as moderating factors in the relationship between CT and EQ among learners, a standard multiple regression analysis was run.

Secondary research questions.

To examine whether there was any significance difference between females and males regarding their EQ, a t-test was run. To identify whether there was any significant relationship between learners' EQ and age, a Pearson Product-Moment correlation was conducted.

Results

In order to analyze the relevant data in this experiment, the Statistical Package for

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Social Sciences (SPSS), version 17 was employed. The level of significance was set at 0.05. Table 2 summarizes the descriptive statistics of the two instruments (i.e., EQ and CT Questionnaires) used in this study.

Table 2
Descriptive statistics of EQ and CT

	N	Minimum	Maximum	Mean	Std. Deviation
CT	85	24.00	60.00	45.21	7.39
EQ	85	338.00	577.00	470.51	53.67

To investigate the relationship between learners' CT and their EI, a Pearson product-moment correlation was applied. The results of correlation revealed that there was a significant correlation between EFL learners' EI and their scores of CT ($r = 0.378$, $*p < 0.05$).

It was also found that there was a significant relationship between EFL learners' CT and the eleven components which compose the total EQ test as follows: CT and 1) Emotional Self-Awareness ($r = 0.224$, $p < .05$), 2) Assertiveness ($r = 0.225$, $p < .05$), 3) Self-Regard ($r = 0.293$, $p < .05$), 4) Empathy ($r = 0.328$, $p < .05$), 5) Interpersonal-Relationship ($r = 0.335$, $p < .05$), 6) Social Responsibility ($r = 0.342$, $p < .05$), 7) Problem Solving ($r = 0.266$, $p < .05$), 8) Flexibility ($r = 0.346$, $p < .05$), 9) Stress Tolerance ($r = 0.311$, $p < .05$), and 10) Optimism ($r = 0.329$, $p < .05$) (see Table 3).

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Table 3
Correlation between components of EQ and CT

	CT	Sig.
Emotional Self-Awareness	* 0.224	0.040
Assertiveness	* 0.225	0.038
Self-Regard	* 0.293	0.006
Self-Actualization	0.203	0.063
Independence	0.153	0.162
Empathy	* 0.328	0.002
Interpersonal-Relationship	* 0.335	0.002
Social Responsibility	* 0.342	0.001
Problem Solving	* 0.266	0.014
Reality Testing	0.192	0.079
Flexibility	* 0.346	0.001
Stress Tolerance	* 0.311	0.004
Impulse Control	0.207	0.057
Happiness	0.119	0.277
Optimism	* 0.329	0.002

To investigate which components of EQ might have more predictive power in predicting learners' CT and how other components contribute to this model, a stepwise regression analysis was employed. The following table is the ANOVA table of regression. The magnitude of *F*-value and the amount of the respective *p*-value (**p* <0.05) indicate the considered model is significant (see Table 4).

Table 4
The ANOVA table of regression

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	547.934	1	547.934	11.256	.001[a]
	Residual	4040.254	83	48.678		
	Total	4588.188	84			
2	**Regression**	815.382	2	407.691	8.861	.000[b]
	Residual	3772.806	82	46.010		
	Total	4588.188	84			

a. Predictors: (Constant), Flexibility
b. Predictors: (Constant), Flexibility, Social Responsibility
c. Dependent Variable: CT

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As Table 5 displays, among the fifteen subscales of EQ, only two subscales (i.e., Flexibility and Social Responsibility) were found to be positive predictors of the dependent variable (i.e., CT).

Table 5
Regression analysis for learners' EQ and CT

Model		Standardized Coefficients Beta	T	Sig.
1	**(Constant)**		8.327	.000
	Flexibility	.346	3.355	.001
2	**(Constant)**		3.327	.001
	Flexibility	.261	2.459	.016
	Social Responsibility	.256	2.411	.018

a. Dependent Variable: CT

Table 6 illustrates the model summary statistics. The results revealed that the model containing the two components of EQ—Flexibility and Social Responsibility—can predict 15 percent of the learners' CT. The *R* value is 0.42 which indicates the correlation coefficient between learners' CT and the two components of EQ. Its square value is 0.17 and its adjusted square is 0.15. It indicates that about 15% of the variation in learners' CT can be explained by taking the two components of EQ into account (see Table 6).

Table 6
R Square table for EQ components as the predictor of learners' CT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.346[a]	.119	.109	6.976
2	.422[b]	.178	.158	6.783

a. Predictors: (Constant), Flexibility
b. Predictors: (Constant), Flexibility, Social Responsibility

To determine the role of gender as a moderator in the relationship between CT and EQ, a standard multiple regression analysis was run. In so doing, three models were considered. EQ in the first model, EQ and gender in the second model, and in

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the third model EQ, gender and the interaction between these two factors were regarded as independent variables. The ANOVA results indicating the extent of *F*-values and the amounts of the associated *p*-values (*$p < 0.05$) demonstrate that the considered models are significant (1St model: $F= 17.936$; 2nd model: $F= 9.682$; 3rd model: $F= 6.399$).

Table 7 illustrates that, among different variables involved in the models, only the *p*-values of EQ is less than 0.05; therefore, the existence of this factor is necessary in the models. The magnitudes of VIF in the third model reveal that the existence of the interaction between gender and EQ causes collinearity in the model.

Table 7
Regression analysis for gender as a moderator in the relationship between CT and EQ

Model		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	(Constant)		2.232	.029		
	EQ	.447	4.235	.000	1.000	1.000
2	(Constant)		2.236	.028		
	EQ	.437	4.146	.000	.994	1.006
	Gender	.122	1.159	.250	.994	1.006
3	(Constant)		2.016	.048		
	EQ	.417	3.278	.002	.692	1.445
	Gender	-.151	-.158	.875	.012	81.448
	Gender x EQ	.277	.287	.775	.012	82.773

a. Dependent Variable: Efficacy

Table 8 demonstrates that information related to the three regression models fitted to the data. The yielded results confirm the findings of ANOVA. Hence, gender does not moderate the association between CT and EI.

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Table 8
R Square table for gender and EQ as the predictors of learners' CT

Model	R	R Square	Adjusted R Square	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.447[a]	.199	.188	.199	17.936	1	72	.000
2	.463[b]	.214	.192	.015	1.343	1	71	.250
3	.464[c]	.215	.182	.001	.083	1	70	.775

a. Predictors: (Constant), EQ
b. Predictors: (Constant), EQ, Gender
c. Predictors: (Constant), EQ, Gender, Gender x EQ

To examine the role of age as a moderating factor in the relationship between CT and EQ, a standard multiple regression analysis was conducted. To this end, three models were considered. In the first model EQ, in the second model EQ and age and in the third model EQ, age and the interaction between these two factors were regarded as independent variables. The amounts of *F*-values and the magnitudes of the related *p*-values ($p < 0.05$) yielded through ANOVA suggest that the overall models are significant (1st model: $F= 18.243$; 2nd model: $F= 10.442$; 3rd model: $F= 6.920$).

Table 9 illustrates that, among the different involved variables, in the first and second models, only the *p*-value of EQ is less than 0.05. Therefore, the existence of this factor is necessary in these models. The magnitudes of VIF in the third model indicate that the presence of the interaction between age and EQ leads to collinearity.

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Table 9
Regression analysis for age as a moderator in the relationship between CT and EQ

Model		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	(Constant)		2.109	.039		
	EQ	.460	4.271	.000	1.000	1.000
2	(Constant)		.285	.777		
	EQ	.461	4.318	.000	1.000	1.000
	age	.162	1.514	.135	1.000	1.000
3	(Constant)		-.344	.732		
	EQ	.997	.702	.485	.006	175.171
	Age	.650	.502	.617	.007	145.293
	Age x EQ	-.725	-.379	.706	.003	318.139

a. Dependent Variable: CT

Table 10 illustrates that information related to the three regression models fitted to the data, which supports the results of ANOVA presented in Table 9. Therefore, it can be concluded that age does not play a significant role in the relationship between learners' CT and EI.

Table 10
R Square table for age and EQ as the predictors of learners' CT

Model	R	R Square	Adjusted R Square	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.460[a]	.212	.200	.212	18.243	1	68	.000
2	.487[b]	.238	.215	.026	2.293	1	67	.135
3	.489[c]	.239	.205	.002	.143	1	66	.706

a. Predictors: (Constant), EQ
b. Predictors: (Constant), EQ, Age
c. Predictors: (Constant), EQ, Age, Age x EQ

To discover whether learners' EQ differs with regard to their gender,

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independent t-tests were run. As Table 12 displays gender plays any significant role neither in the learners' total EQ nor in their EQ components.

Table 11
Independent T-test for determining the role of gender in CT and EQ

	t	df	Females' mean score	Males' mean score	Sig. (2-tailed)
Emotional Self-Awareness	-.321	33.656	28.49	28.95	.750
Assertiveness	.946	72	24.56	23.65	.347
Self-Regard	-.797	72	33.78	34.91	.428
Self-Actualization	-.407	72	33.43	33.95	.685
Independence	1.050	72	24.39	23.21	.297
Empathy	-.880	72	29.70	30.65	.382
Interpersonal Relationship	-1.463	72	39.49	41.69	.148
Social Responsibility	-1.738	72	37.25	39.34	.086
Problem Solving	.299	72	29.66	29.26	.766
Reality Testing	-.768	72	34.23	35.26	.445
Flexibility	-.332	72	26.45	26.91	.741
Stress Tolerance	.017	72	28.98	28.95	.986
Impulse Control	-.452	72	28.92	29.73	.652
Happiness	-1.334	72	33.64	35.56	.186
Optimism	.445	72	30.25	29.73	.658
Total EQ	-.638	72	463.27	471.82	.525

To investigate the relationship between learners' EQ and their age, Pearson product-moment correlation was employed. The results revealed that there was no significant relationship between the learners' age and EQ (see Table 12).

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Table 12
Correlation between learners' EQ and Age

	Age	**Sig.**
Emotional Self-Awareness	-.025	.839
Assertiveness	-.124	.308
Self-Regard	.011	.929
Self-Actualization	.027	.821
Independence	-.154	.203
Empathy	.085	.482
Interpersonal Relationship	.005	.970
Social Responsibility	.101	.404
Problem Solving	.064	.599
Reality Testing	.087	.475
Flexibility	.014	.906
Stress Tolerance	.009	.942
Impulse Control	-.103	.398
Happiness	-.084	.490
Optimism	.053	.661
Total EQ	-.004	.973

Discussion

The present study addressed the relationship between CT and EI among Iranian EFL learners. The results substantiated a dynamic interplay between the two variables in question. At first glance, it may seem contrary to traditional beliefs which deemed improvements in emotional abilities deterrent to the development of cognitive and thinking abilities. It may also appear inconsistent with prevailing stereotypes and misconceptions suggesting that thoughts and emotions are in conflict with each other or function independently. The present study, nevertheless, revealed students' EI tends to better equip them with CT abilities. As discussed earlier, an emerging body of theoretical contentions in the literature set to demonstrate the mutual association between cognitive and affective dimensions, which is conducive to effective learning. Meyers (1986), Brookfield (1987) and Paul (1987) were among the first scholars who argued that thoughts and emotions are inextricably bound (as cited in Moon, 2008). Brookfield (1987, as cited in Moon, 2008) puts forward the idea that personal emotion has a decisive role in CT, and that information about personality and emotional states of an individual should be obtained before instructing him/her how to think critically. In a similar vein,

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Elder (1996) maintains that CT is not capable of successfully leading our beliefs and actions unless it continually assesses not simply our cognitive abilities, but also our feeling or emotion states. Key to this discussion is that engaging in high quality reasoning (such as CT) entails not only having the cognitive ability but also the drive or desire to do so. Indeed, one must feel the significance of doing so and be committed to it. From the commonsense perspective, in the absence of sound emotional competencies, ideas and circumstances tend to be responded by immediate affective reactions, which might be susceptible to fallacy. This can create an orientation in individual's mind which is difficult to modify and will potentially influence subsequent reasoning, judgments and decisions whereas regulation and manipulation of emotional states can pave the way for making reflective and purposeful judgments and decisions.

More recently, situating CT within EI framework, Moon (2004) proposed a grounded model intended to explore the forms of relationship that might exist between EI and CT (as cited in Moon, 2008). The framework demonstrates that emotion can have an influence on the process of CT and alternatively it may arise from the process of CT, although not in a simple and straightforward manner. In essence, the moderate association found between learners' EI and CT in the present study provides empirical support to the theorized association between these two constructs.

Scrutinizing the existing literature on EI and CT, the researchers of the present study came across a limited number of empirical studies corroborating the relationship between these two constructs. Although these studies are quite scant in number and concern predominantly with L1 contexts, the findings are consistent with the results of the present study. For instance, Stedman and Andenoro (2007) found a substantially positive relationship between EI and CT disposition in undergraduate leadership students. Brackett and Katluka (2007) indicated that their emotional literacy program designed to develop emotion-related skills in students will also promote overall academic learning by enhancing abstract reasoning and critical thinking.

As indicated earlier, among the components of EQ, *flexibility* and *social responsibility* were found to have the highest correlations with CT and were also shown to be positive predictors of CT. With the moderate correlation to flexibility–the ability to adjust one's feelings/thoughts to change (Bar-On, 2000)–it would

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appear that individuals who are more recipient to diverse ideas and who are more sensitive to contingencies, are more capable of demonstrating abilities associated with CT. The context of the present study may have also contributed to this finding. Studying at higher education is associated with divergence and reflectivity which entail processing and assessing the variety of information and subjects they may receive in the course of their university education. This in turn necessitates embracing new ideas and being prepared to change one's idea in the face on new and more authentic evidence and information. Thus, it is expected when this is fulfilled, learners can skillfully manipulate identifying, evaluating and constructing diverse arguments and are better equipped to infer a conclusion from multiple and sometimes contradictory premises. In other words, their CT ability, which is in fact the highest level of thinking constituting the ultimate objective of the agenda of higher education (Jarvis, 2005), is enhanced.

Viewing from everyday life perspective, it is apparent that the world is changing rapidly and that the new issues arise and the old ones are revisited. According to Wright (2002) we should respond to these by making reflective and reasonable decisions which entail reacting flexibly to ever-increasing changes in conditions and environments. Likewise, Moon (2008) postulated that in order to display a critical engagement with the world, learners should have flexibility in their learning and should not be rigid. They also need to demonstrate "willingness to accept that others can have different views of the world and to work with this" (p. 137). Facione (2010) also posited that an ideal critical thinker possesses several attributes, including "flexibility in considering alternative and opinions, and prudence in suspending, altering or revising judgments" (p.10). Thus, it can be concluded that in today's rapidly changing context, it is open-mindedness regarding divergent world views that is valued, not simply demonstrating a narrow and rigid set of thinking skills.

The relationship between CT and social responsibility–the ability to demonstrate oneself as a cooperative, contributing and constructive member of one's social group (Bar-On, 2000) – indicates that the learner's level of social maturity creates an ability to think critically. This is hardly surprising in the view of the fact that CT skills involve the ability to identify and assess diverse arguments, make decisions and evaluate one’s stance on particular issues. To carry out these tasks, individuals need to come into contact with multiple perspectives, practice cooperative thinking, experience interconnectedness, and analyze and

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interpret social, cultural and international perspectives. This is possible when individuals feel assured that others value their thinking and that their thinking makes a difference by improving their own lives or influencing others. These requirements fall adequately within the domain of social responsibility, since as Berman (1991) contended the initiatives behind social responsibility are associated with helping individuals develop a sense of connection with their surroundings, develop basic social skills and the confidence to make a difference in the world. Educators also argued that part of the individuals' failure to become active and accountable participants in society stems from lack of thinking skills required for understanding complex social issues (Berman, 1991).

The association between social responsibility and CT can be also explained in the light of the context of the present study. According to the current perspectives of education, higher education is no longer viewed "as a private good which only benefits students, but should also be appreciated as a public good which benefits the society" (Facione, 2010, p.2). Facione (2010) maintains that teaching individuals to make reflective decisions and judgments, and becoming contributing members of the society are positively associated. Scholars in the field of higher education contend that CT is a standard of intellectual excellence required for full and constructive participation in the social life of students (Scriven & Paul, 2004).

The third and fourth research questions aimed at investigating the roles of age and gender as moderating factors in the relationship between students' EQ and CT. The findings illustrated that none of the predicted moderators had a significant impact on the relationship between CT and EQ. This suggests that regardless of gender or age, a learner's CT ability is related to his/her level of EQ. Hence, it can be argued that EQ is a significant predictor of CT skill even after controlling the effects of gender and age.

The researcher's fifth question investigated the relationship between gender and EQ. The results indicated that there was no difference between males and females in their EQ. This finding contradicts the previous research reporting gender differences in EQ. For instance, Perry, Ball and Stacey's (2004) and Day and Carroll's (2004) demonstrated a positive relationship between EQ and age. According to Penrose, Perry and Ball (2007), the higher females' EQ can be attributed to the typical sample population of many of studies conducted in the

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domain of EI: they are undertaken in the context of universities dominated by female population.

The sixth research question intended to examine whether there was any relationship between EFL learners' EQ and their age. Experts in the field of EQ postulate that EI is a developing ability and tends to increase over time. The researchers of the present study, thus, presumed that with the passage of years and individuals getting older they should exhibit higher levels of EI. The results, however, did not support this hypothesis. It was found that younger and older learners did not display any significant difference in their EQ. In other words, university students who exhibit high levels of EQ are not necessarily the ones who are older. This is in accordance with Atkins and Stough's (2005) and Perry, Ball and Stacey's (2004) studies. This finding is, nevertheless, in contrast with Goleman's (1995) and Bar-On's (2006) contention that EI develops over time and increases with age. It also contradicts the findings of Penrose, Perry and Ball (2007) and Ghanizadeh and Moafian (2010). The lack of relationship between age and EQ in the present study can be plausibly argued in the light of age range of the participants. The restricted age range of participants might make it difficult to discern the relationship with emotional intelligence and generalize the results to other diverse populations. Hence, to further examine the relationship between emotional intelligence and age, a broader range of ages should be examined in future research.

Conclusion

In essence, the findings of the present study yielded several conclusions. First, this study demonstrated that EFL university students' EQ is linked to their CT level. Second, the relationship between EFL learners' EQ and CT is not moderated by their age and gender. Third, EFL learners' EQ does not differ with their age and gender. These conclusions demonstrate the importance of planning and executing effective programs and strategies for developing EQ for all students irrespective of their age and gender.

The conclusions and recommendations derived from the present study encourage educators to take advantage of this relationship by providing university students with experiences which elicit their EI. In doing so, there is opportunity to enhance their CT ability as well.

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The findings of the present study have some implications for curriculum designers, material developers and EFL teachers and lecturers. Curriculum developers are recommended to take into account the link between emotions and thought in developing courses and programs for EFL students by focusing on skills associated with EI so that they not only attain more emotional achievements but also become more skillful critical thinker. In designing EQ development programs taking into account the points leading to the effectiveness of such programs are critical. Wears and Gray (2003, cited in Jarvis, 2005, p.160) have stated that successful EQ development programs share the following attributes: 1) Behaviors are explicitly taught, 2) Skills are taught in empowering ways, 3) A step-by-step approach is taken, 4) Generic skills are generalized to real life, 5) Programs are positive and active, 6) Programs make use of interactions, and 7) Programs are congruent with the wider system.

In the course of preparing the materials for EFL students, material developers are required to design materials encompassing this type of intelligence, to present its impact on education and in general on life and to suggest helpful strategies for its development.

EFL teachers and lecturers are advised to develop and integrate the abilities associated with EQ in the classroom context. In so doing, paying special attention to two components of *flexibility* and *social responsibility* are required. They are recommended to pinpoint the effective path for developing learners' social responsibility. Important for improving learners' flexibility is to teach them to deal with uncertainty and conflict and to encourage them to consider alternative explanations of the situation or views. Equally required is encouraging the learners to reconsider and revise views where reflection suggests that modification is warranted.

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