

# Does Emotional Intelligence or Self-Efficacy Have Something to Do with High School English Teachers' Critical Thinking, Considering Demographic Information?

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## **Abstract**

The current study examined the associations between critical thinking (CT) with emotional intelligence (EI) and also with self-efficacy at high schools. To this aim, 64 high school EFL teachers participated in the study. The participants were required to complete the "Teachers' Sense of Efficacy Scale", the "Emotional Intelligence Questionnaire" and the "Watson-Glaser Critical Thinking Appraisal". Descriptive statistics, Pearson product-Moment correlations and regression analyses were employed to analyze the data. The findings of the study revealed that CT was related to EI, but not to self-efficacy. Furthermore, no moderating roles were found for age, gender or teaching experience in the relationship between CT and EI. Taken together, these findings advance the understanding of the interplay between CT and EI.

**Keywords:** Critical thinking, Emotional intelligence, Self-efficacy

## 1. Introduction

Language teaching and learning has been involved in a surge in approaches and methods from the 1880s to the 1970s. After one century of "changing winds and shifting sands" in the history of the field and the emergence of the post method era, the time was ripe to observe covert sluggishness and even stagnancy in language teaching development. In order not to repeat the same error, experts must eradicate the causes of the problem and eschew probable reasons. Along with this line of inquiry, recently, a greater awareness of issues like teacher, learner, classroom, setting, and culture have achieved and received considerable attention, among which, teacher is the major focus of the current study.

Recently, the teacher has been the subject of investigation (e.g., Richards & Nunan, 1990; Suwandee 1995; Taghilou, 2007); with an indispensable role assigned to the teacher in the classroom, and more importantly his beliefs. Indeed, it seems that "beliefs are far more influential than knowledge in determining how individuals organize and define tasks and problems and are stronger predictors of behavior" (Pajares, 1992, p. 311). The question at issue is what the role of a teacher can be while approaches and methods are prescribed. Provided that teachers accept to be a more active agent in their classroom, how can they intelligently adjust the latest achievements of the eminent educational experts? How can they imagine having their own say in their unique class while implementing the latest scientific findings, while they are aware of their stance in academic hierarchy? Seemingly, critical thinking (CT) is one of the "lost rings". It appears that CT lurks behind much of the thinking about higher education and professional development. Now, this construct and its relation to the educational development seem to have emerged crucial. CT development is considered to be central to the higher levels of education or it is a fundamental goal of learning (Keeley & Shemberg, 1995; Kuhn, 1999).

"CT is a kind of evaluative thinking which involves both criticism and creative thinking and is particularly concerned with the quality of reasoning or argument which is presented in support of a belief or a course of action" (Fisher, 2001, p. 13). "Thinking critically involves our recognizing the assumptions underlying our beliefs and behaviors. It means we can give justifications for our ideas and actions. More importantly, perhaps, it means we try to judge the rationality of the justifications..... We can test the accuracy and rationality of these justifications against some kind of objective analysis of the 'real' world as we understand it" (Brookfield, 1987, pp. 13–14; cited in Moon, 2008). 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; determining if conclusions follow from information in given statements, and evaluating arguments as being strong and relevant or weak and irrelevant (pp. 21-23).

It appears that CT could be obtained while the teacher puts credence in his knowledge and abilities and here again another factor, called self-efficacy, might be required to help the teacher think he is also able to create a dynamic method unique to his classroom and even prescribe one for each student. Bandura (1997, p. 3) defined self-efficacy as "beliefs in one's

capabilities to organize and execute the courses of action required to produce given attainments". According to Bandura (2001), CT is associated with other cognitive variables such as motivation and self-efficacy beliefs. He stated that individuals assess their motivation, beliefs and values through critical and reflective practices which in turn may lead to "verification of soundness of one's thinking" (p.10). In an educational context, Bandura's (2001) contention regarding the association between CT and self-efficacy seems reasonable and applicable. The history of human inventions and innovations is full of people who have had a deep belief in their own abilities that they can make a change for a better, easier, and more successful life. So teachers, by the same token, shall not be exceptions. As a logical conclusion, and not based on empirical studies due to the lack of enough empirical research in this realm, self-efficacious teachers seem to be more able to critically think about the stimuli (including experts' theories and views, students' needs, etc.) they receive in an educational context. In other words, since they believe in their capabilities and knowledge in their profession, they are more able and more likely to bring experts' ideas, theories and suggestions into modification based on the facts they encounter in their unique educational environments and the feedbacks they receive from students.

Another factor which does not seem irrelevant to the improvement of teachers' CT is emotional intelligence (EI). Bar-On (2000) defined EI as the sum of capabilities, competencies and non-cognitive skills that influences a person's abilities to succeed while encountering environmental pressures. To put it another way, he sustained that EI is the capability to realize emotions and the way these emotions influence interpersonal relationships (cited in Hashemi, 2008). The term EI, as the name implies, indicates the connection between emotion and cognition (Mayer, Salovey & Caruso, 2000). Brookfield (1987) believed that emotion is central to CT. He stated, "challenging unquestioned assumptions, looking skeptically at givens we have lived by, and trying to shake off habitual ideas and behaviors so that we can try out alternatives, are emotionally potent activities" (Brookfield, 1987, pp. 231–2; cited in Moon, 2008). Berg (2008) regarded emotions as affective, subjective and neurochemical phenomena influencing the cognitive, psychological and physical systems. In her view, "emotions drive goals and are integrated with cognitive functions" (p. 94). Moon (2008) considered CT as a direct social activity (often) and emotional awareness as its indispensable ingredient to communicate appropriately and in a clear and precise manner. Additionally, Elder (1996) contended that CT cannot successfully conduct individuals' acts and beliefs unless it constantly evaluates not only their cognitive abilities, but also their feelings and emotional states, as well as their hidden and overt drives and plans.

Since CT plays a crucial role in effective teaching (Birjandi & Bagherkazemi, 2010; Richrads & Nunan, 1990), a plethora of studies have been conducted focusing on teachers' CT as one of their major variables. For example, Dinkelman (2000) studied the extent, nature and development of CT in three social studies of preservice teachers. The results yielded that teacher educators had great influence in enhancing critical reflection in preservice teachers. The results of the study also backed assuming critical reflection as a practical aim of preservice teacher education. Yeh (2004) also studied the impact of a computer simulation

program on advancing future teachers' reflective teaching. It was divulged that computer simulation was an efficient tool for teaching general CT skills and improving reflective teaching among preservice teachers.

In the realm of language education, Birjandi and Bagherkazemi (2010) studied the relationship between EFL teachers' CT and their pedagogical success in language teaching. The results of their research revealed a significant correlation between these two variables among teachers. In a qualitative study, Yang (2005) discussed the important role that a critically reflective teacher plays in L2 educational contexts. As she argued, being enthusiastic, creative and informative in language education are three attributes that a critically reflective teacher should acquire. Nonetheless, a review of literature on teachers' CT and its relationship with their EI and self-efficacy demonstrates that this area of inquiry has not received enough attention by scholars and the literature is quite rare. To the researchers' best knowledge, the only existing empirical study focusing on the association between these variables is the one which has been conducted by Moafian and Ghanizadeh (2010). Moafian and Ghanizadeh examined the associations between CT and self-efficacy among 94 English language teachers in language institutes and the results of their study revealed no significant relationship between the two variables. Regarding the association between teachers' CT and EI, to the researchers' knowledge, no research to date has considered this association. Additionally, the literature is relatively scant as far as the relationship between the variables is concerned. The existing studies are as follows: Phan (2007) examined the relationship between students' learning approaches, self-efficacy, stages of reflective thinking and academic performance. The results revealed that self-efficacy predicted the different stages of reflective thinking except for CT as one of the components of reflective thinking. In an L2 context, Moafian and Ghanizadeh (2011) examined the role of EFL university students' CT in their self-efficacy beliefs. They also investigated the role of gender as a moderating factor in the relationship between students' CT and self-efficacy. The findings of the study indicated a significant relationship between learners' CT and self-efficacy beliefs; though, gender did not moderate the relationship between the two variables.

Considering the significant relationship between EFL teachers' CT and their professional success (Birjandi & Bagherkazemi, 2010), reviewing the theoretical contentions regarding the existence of a possible relationship between CT and the two constructs of EI and self-efficacy (Bandura, 2001; Brookfield, 1987; Elder, 1996; Moon, 2008) and the dearth of empirical research in this area led the researchers to empirically investigate the relationship between high school English language teachers' CT (as a dependent variable) and these two variables, i.e., EI and self-efficacy (as independent variables). To fulfill the aims of the study, the following research questions were posed and investigated:

- 1) Is there any relationship between EFL teachers' CT and self-efficacy?
- 2) Is there any relationship between EFL teachers' CT and EI?
- 3) Does gender moderate the relationship between EFL teachers' CT and EI?
- 4) Does age moderate the relationship between EFL teachers' CT and EI?

5) Does teaching experience moderate the relationship between EFL teachers' CT and EI?

## 2. Method

### 2.1 Participants

Participants were 64 Iranian high school EFL teachers. The profile of the teachers goes as follows: they were between 22 and 55 years old ( $M = 36.42$ ,  $SD = 6.07$ ) (three teachers did not specify their age) with 1 to 30 years of teaching experience ( $M = 13.06$ ,  $SD = 6.86$ ) (two of them did not specify their teaching experience). Out of 64 teachers, 26 were females and 37 males from different socio-economic backgrounds (one participant did not specify their gender). 58 teachers majored in different subfields of English (including teaching, literature and Translation), 4 had certificate in majors other than English, and 2 did not specify their majors. Participants' level of education varied from B.A. to M.A. except for two who had A.A. (Associate in Arts) and Ph.D. in English.

### 2.2 Instruments

#### 2.2.1 Watson-Glaser's Critical Thinking Appraisal (Form A)

"Watson-Glaser Critical Thinking Appraisal" (CTA) (Form A) was employed to assess CT. This test consists of 80 items and 5 subtests as Inference, Recognizing Unstated Assumptions, Deduction, Interpretation and Evaluation of Arguments (Hajjarian, 2008).

Concerning the reliability of the Watson-Glaser test, an acceptable level of reliability has been reported for it (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 for the Iranian culture. In this study, the total reliability of the questionnaire, calculated via Cronbach's alpha, was found to be 0.64.

#### 2.2.2 EQ Test

"Bar-On EI test" was applied to evaluate the teachers' EQ. The Bar-On EI test, known as the emotional quotient inventory (EQ-i), is a self report device measuring emotionally and socially intelligent behaviors and offers an estimate of emotional-social intelligence (Bar-On, 1997). The test comprises 133 items measuring five broad areas of skills and fifteen factorial components. It makes use of a five-point likert scale ranging from 'Never' to 'Always'. Each item has a value of 1 ranging to 5. In this research, the Persian version of the EQ test was employed. As Dehshiri (2003) contended, the test is reliable and valid in an Iranian culture. In this study, the total reliability of the questionnaire, estimated via Cronbach's alpha, was 0.82.

### 2.2.3 Teachers' Sense of Efficacy Scale (Long Form)

To determine teachers' efficacy level, the Teachers' Sense of Efficacy Scale, also called the *Ohio State Teacher Efficacy Scale (OSTES)*, designed by Tschannen-Moran and Woolfolk Hoy, was employed. The long form (including 24 items)– applied in the current study – encompasses three subscales: *efficacy in student engagement, efficacy in instructional strategies, and efficacy in classroom management*. Each subscale loads equally on eight items, and every item is measured on a 9-point scale anchored with the notations: “nothing, very little, some influence, quite a bit, a great deal”.

The total reliability and the reliability of each individual factor – reported by Tschannen-Moran and Woolfolk Hoy (2001) – are presented in the following table.

Table 1. Reliability reports of OSTES

	<b>Mean</b>	<b>SD</b>	<b>Alpha</b>
<b>OSTES</b>	7.1	.94	.94
<b>Student Engagement</b>	7.3	1.1	.87
<b>Instructional Strategies</b>	7.3	1.1	.91
<b>Classroom Management</b>	6.7	1.1	.90

In the present study, the total reliability of the questionnaire, calculated via Cronbach's alpha, was 0.84.

### 2.3 Data Collection

The study was carried out at public high schools in four provinces of Ardabil, Kerman, Khorasan-Razavi and Khuzestan over a period of one month, in the summer of 2010. Teachers were given a brief introduction to the project and then the three questionnaires, the Bar-On EQ test, the Watson-Glazer critical thinking appraisal (form A) and teachers' sense of self-efficacy scale (long form) were distributed among them. Since the reliability of the answers was a matter of importance to the researchers, and also items in the questionnaires (esp. EQ questionnaire) were related to the private information of the participants, questionnaires were coded numerically, and anonymity was guaranteed to assure the teachers that their answers would not be revealed to anyone, even to the researchers themselves. Concerning ethical procedures, the questionnaires were filled after informing all the teachers who participated in the process of data collection about the significance of the study and the highly likely influence of the results on the improvement of their teaching practice. Therefore, all these participants were completely willing to voluntarily take part in the study and asserted their consent verbally. 240 questionnaires (80 CT, 80 EQ and 80 self-efficacy questionnaires) were distributed out of which 192 (64 CT, 64 EQ and 64 self-efficacy questionnaires) were returned to the researchers.

### 2.4 Data Analysis

To ensure the normality of the distribution, descriptive statistics was used. To determine the relationship between teachers' CT and EI, and also teachers' CT and self-efficacy, a Pearson

Product-Moment correlation was run. To find out which components of EI might have more predictive power in predicting teachers' CT, a stepwise regression analysis was run. To examine whether gender, age and teaching experience moderate the association between CT and EI among teachers, standard multiple regression analyses were conducted.

### 3. Results

In order to analyze the relevant data in this experiment, the Statistical Package for Social Sciences (SPSS), version 17 was employed. The level of significance was set at 0.05. Table 2 summarizes the descriptive statistics of the three instruments – CT, EQ and Teacher Self-Efficacy Questionnaires – employed in the research.

Table 2. Descriptive statistics for CT, EQ and Self-Efficacy

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>SD</b>
<b>CT</b>	64	23	59	43.593	7.804
<b>EQ</b>	64	357	583	475.625	60.976
<b>Self-Efficacy</b>	64	112	205	159.546	22.497

To investigate the correlation between teachers' CT and self-efficacy, a Pearson Product-Moment correlation was conducted. The results of the correlation revealed that there was no significant correlation between teachers' CT and their total scores in self-efficacy ( $r = .075, p > .05$ ). It was also found that there was no significant relationship between teachers' CT and the three subscales composing the total self-efficacy scale, the results of which are as follow: 1) CT and Student Engagement ( $r = -.197, p > .05$ ), 2) CT and Instructional Strategies ( $r = .194, p > .05$ ), and 3) CT and Classroom Management ( $r = .205, p > .05$ ) (See Table 3).

Table 3. Correlation between teachers' Self-Efficacy and CT

	<b>CT</b>	<b>Sig.</b>
<b>Student Engagement</b>	-0.197	0.119
<b>Instructional Strategies</b>	0.194	0.124
<b>Classroom Management</b>	0.205	0.105
<b>Total Self-Efficacy</b>	0.075	0.557

To investigate the correlation between teachers' CT and EQ, a Pearson Product-Moment correlation was run. The results indicated a significant correlation between teachers' CT and their scores on the EQ test ( $r = .303, p < .05$ ).

It was also found that, among the fifteen components of the EQ test, six had a statistically significant relationship with teachers' CT, namely, 1) Emotional Self-Awareness ( $r = .261, p < .05$ ), 2) Assertiveness ( $r = .418, p < .05$ ), 3) Empathy ( $r = .345, p < .05$ ), 4) Social Responsibility ( $r = .404, p < .05$ ), 5) Problem Solving ( $r = .481, p < .05$ ), and 6) Optimism ( $r = .324, p < .05$ ) (See Table 4).

Table 4. Correlation between the components of teachers' EQ and CT

	<b>CT</b>	<b>Sig.</b>
<b>Emotional Self-Awarenes</b>	0.261*	0.037
<b>Assertiveness</b>	0.418*	0.001
<b>Self-Regard</b>	0.191	0.131
<b>Self-Actualization</b>	0.224	0.076
<b>Independence</b>	0.073	0.568
<b>Empathy</b>	0.345*	0.005
<b>Interpersonal-Relationship</b>	0.151	0.234
<b>Social Responsibility</b>	0.404*	0.001
<b>Problem Solving</b>	0.481*	0.000
<b>Reality Testing</b>	0.234	0.062
<b>Flexibility</b>	0.005	0.972
<b>Stress Tolerance</b>	0.176	0.164
<b>Impulse Control</b>	0.008	0.952
<b>Happiness</b>	0.242	0.054
<b>Optimism</b>	0.324*	0.009

\* Correlation is significant at the 0.05 level (2-tailed)

To examine which components of EQ might have more predictive power in predicting teachers' CT, a stepwise regression analysis was run. The following table is the ANOVA table of regression. The magnitudes of F-values and the amounts of the respective p-values ( $p < .05$ ) indicate that the considered models are significant (See Table 5).

Table 5. The ANOVA table of regression

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>1</b>					
<b>Regression</b>	316.911	1	887.446	18.651	.000 <sup>a</sup>
<b>Residual</b>	2949.991	62	47.581		
<b>Total</b>	3837.438	63			
<b>2</b>					
<b>Regression</b>	1128.826	2	564.413	12.711	.000 <sup>b</sup>
<b>Residual</b>	2708.611	61	44.403		
<b>Total</b>	3837.438	63			
<b>3</b>					
<b>Regression</b>	1369.465	3	456.488	11.098	.000 <sup>c</sup>
<b>Residual</b>	2467.972	60	41.133		
<b>Total</b>	3837.438	63			

a. Predictors: (Constant), Problem Solving

b. Predictors: (Constant), Problem Solving, Assertiveness

c. Predictors: (Constant), Problem Solving, Assertiveness, Self-Regard

d. Dependent Variable: CT

As Table 6 illustrates, three subscales of the EQ – Problem Solving, Assertiveness, and Self-Regard – were found to be good predictors of the dependent variable (CT).

Table 6. Results of the regression analysis for teachers' CT and EQ

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
<b>1</b>					
(Constant)	21.963	5.082		4.322	.000
Problem Solving	.713	.165	.481	4.319	.000
<b>2</b>					
(Constant)	14.896	5.770		2.582	.012
Problem Solving	.556	.173	.375	3.209	.002
Assertiveness	.507	.218	.272	2.332	.023
<b>3</b>					
(Constant)	16.700	5.603		2.980	.004
Problem Solving	.761	.187	.513	4.069	.000
Assertiveness	.784	.239	.421	3.287	.002
Self-Regard	-.427	.176	-.347	-2.419	.019

a. Dependent Variable: CT

Table 7 illustrates the model summary statistics. The magnitude of adjusted R square reveals that EQ can predict 37 percent of the teachers' CT. In other words, it indicates that about 37% of the variation in teachers' CT can be explained by taking their EQ into account (See Table 7).

Table 7. R square table for EQ as the predictor of teachers' CT

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
<b>1</b>	.481 <sup>a</sup>	.231	.219		6.89786
<b>2</b>	.542 <sup>b</sup>	.294	.271		6.66359
<b>3</b>	.597 <sup>c</sup>	.357	.375		6.41349

a. Predictors: (Constant), Problem Solving

b. Predictors: (Constant), Problem Solving, Assertiveness

c. Predictors: (Constant), Problem Solving, Assertiveness, Sela-Regard

To determine the role of gender as a moderator in the relationship between CT and self-efficacy among teachers, a standard multiple regression analysis was employed. In so doing, three models were considered. In the first model, EQ, in the second model, EQ and gender, and in the third model, EQ, gender and the interaction between these two factors were considered as independent variables. The extent of *F*-values and the amounts of the associated *p*-values ( $p < 0.05$ ) in the ANOVA table of regression suggested that the models were significant (1<sup>st</sup> model:  $F = 5.705$ ; 2<sup>nd</sup> model:  $F = 3.997$ ; 3<sup>rd</sup> model:  $F = 2.957$ ).

Table 8 illustrates that the p-value of EQ in the first model is less than .05; therefore, the existence of this factor is necessary in the model. The magnitudes of VIF in the third model reveal that the existence of the interaction term (interaction between gender and EQ) causes collinearity in the model.

Table 8. The results of regression analysis for gender as a moderator in the relationship between CT and EQ

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
	B	Std. error	Beta			Tolerance	VIF
<b>1</b>							
(Constant)	25.874	7.402		3.495	.001		
EQ	.037	.015	.292	2.389	.020	1.000	1.000
<b>2</b>							
(Constant)	31.906	8.394		3.801	.000		
EQ	.028	.016	.221	1.695	.095	.863	1.158
Gender	-3.001	2.033	-.193	-1.476	.145	.863	1.158
<b>3</b>							
(Constant)	21.998	13.438		1.637	.107		
EQ	.048	.027	.378	1.791	.078	.331	3.019
Gender	12.515	16.550	.803	.756	.453	.013	76.614
Gender x EQ	-.032	.034	-.956	-.945	.349	.014	69.558

a. Dependent Variable: CT

Information related to the three regression models fitted to the data is depicted in Table 9. The yielded results support the results of the ANOVA presented in Table 8. Thus, it can be concluded that gender does not moderate the relationship between CT and EQ.

Table 9. R square table for gender and EQ as the predictors of teachers' CT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R	F	df1	df2	Sig.
1	.292 <sup>a</sup>	.086	.071	7.45298	.086	5.705	1	61	.020
2	.343 <sup>b</sup>	.118	.088	7.38202	.032	2.178	1	60	.145
3	.362 <sup>c</sup>	.131	.087	7.38865	.013	.892	1	59	.349

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 purpose, 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 quantities of *F*-values and the magnitudes of the respective *p*-values ( $p < .05$ ) demonstrated that the considered models were significant (1<sup>st</sup> model:  $F = 7.348$ ; 2<sup>nd</sup> model:  $F = 3.825$ ; 3<sup>rd</sup> model:  $F = 2.894$ ).

As the results of Table 10 demonstrate, among different variables involved in the models, only the *p*-value of EQ is less than .05; therefore, the presence of this factor is necessary in the models. The magnitudes of VIF demonstrate no collinearity in the model.

Table 10. The results of regression analysis for age as a moderator in the relationship between CT and EQ

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
	B	Std. error	Beta			Tolerance	VIF
<b>1</b>							
(Constant)	23.590	7.421		3.179	.002		
EQ	.042	.016	.330	2.711	.009	1.000	1.000
<b>2</b>							
(Constant)	26.122	8.524		3.065	.003		
EQ	.043	.016	.339	2.748	.008	.988	1.012
Age	-.082	.134	-.076	-.614	.542	.988	1.012
<b>3</b>							
(Constant)	23.592	8.879		2.657	.010		
EQ	.055	.020	.432	2.808	.007	.632	1.581
Age	-.034	.142	-.031	-.238	.813	.876	1.141
Age x EQ	.000	.000	-.165	-1.015	.314	.569	1.757

a. Dependent Variable: CT

Table 11 shows information related to the three regression models fitted to the data. The obtained results confirm the findings of the ANOVA as depicted in Table 10. Consequently, age does not play a significant role in the association between teachers' CT and EQ.

Table 11. R square table for age and EQ as the predictors of teachers' CT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R	F	df1	df2	Sig.
1	.330 <sup>a</sup>	.109	.094	7.34497	.109	7.348	1	60	.009
2	.339 <sup>b</sup>	.115	.085	7.38340	.006	.377	1	59	.542
3	.361 <sup>c</sup>	.130	.085	7.38152	.015	1.030	1	58	.314

a. Predictors: (Constant), EQ

b. Predictors: (Constant), EQ, Age

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

To investigate the role of teaching experience 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 teaching experience, and in the third model, EQ, teaching experience and the interaction between these two factors were regarded as independent variables. The ANOVA table showing the amounts of *F*-values and the extent of the related *p*-values proposed that only the first model is significant (1<sup>st</sup> model:  $F= 6.076$ ,  $p < .05$  ; 2<sup>nd</sup> model:  $F= 2.987$ ,  $p > .05$ ; 3<sup>rd</sup> model:  $F= 2.322$ ,  $p > .05$ ).

According to Table 12, only the *p*-value of EQ in the first and second models is less than .05. Accordingly, the existence of this factor is necessary in these two models. The magnitudes of VIF in the third model indicate that the existence of the interaction term (interaction between teaching experience and EQ) leads to collinearity in the model.

Table 12. The results of regression analysis for teaching experience as a moderator in the relationship between CT and EQ

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	CollinearityStatistics	
	B	Std. error	Beta			Tolerance	VIF
<b>1</b>							
(Constant)	25.268	7.451		3.391	.001		
EQ	.038	.016	.303	2.465	.017	1.000	1.000
<b>2</b>							
(Constant)	25.286	7.618		3.319	.002		
EQ	.038	.016	.303	2.438	.018	.994	1.006
T.E	-.002	.141	-.002	-.014	.989	.994	1.006
<b>3</b>							
(Constant)	40.001	16.631		2.405	.019		
EQ	.008	.035	.061	.222	.825	.205	4.867
T.E	-1.118	1.130	-.988	-.989	.327	.015	64.776
T.E x EQ	.002	.002	1.041	.995	.324	.014	71.072

a. Dependent Variable: CT

T.E stands for Teaching Experience

Table 13 demonstrates information related to the three regression models fitted to the data. The yielded results substantiate the findings of the ANOVA presented in Table 12; as a result, teaching experience does not moderate the relationship between teachers' CT and EQ.

Table 13. R square table for teaching experience and EQ as the predictors of teachers' CT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R	F	df1	df2	Sig.
1	.303 <sup>a</sup>	.092	.077	7.46837	.092	6.076	1	60	.017
2	.303 <sup>b</sup>	.092	.061	7.53138	.000	.000	1	59	.989
3	.327 <sup>c</sup>	.107	.061	7.53197	.015	.991	1	58	.324

a. Predictors: (Constant), EQ

b. Predictors: (Constant), EQ, Teaching Experience

c. Predictors: (Constant), EQ, Teaching Experience, Teaching Experience x EQ

#### 4. Discussion

Emphasizing teachers' CT as a predictor of success in educational settings (Birjandi & Bagherkazemi, 2010), the current paper examined the possible relationships of teachers' CT with EQ and self-efficacy to create a more productive teaching and learning environment. In this section, a summary of the extracted responses from data analysis is offered to address the research questions developed to guide this study.

The first research question aimed at investigating the relationship between CT and teacher self-efficacy. The result demonstrated that there was no significant relationship between the two variables. The yielded result confirms the findings obtained from Moafian and Ghanizadeh's (2010) study in which no significant relationship was reported between CT and self-efficacy among EFL teachers in language institutes. Also, the result verifies what Phan (2007) found, that CT as one of the components of reflective thinking, is not significantly related with learners' self-efficacy, even though other components (habitual action, understanding, and reflection) were found positively associated with it. On the contrary, this finding of the study disconfirms the results of a similar research on university students (Moafian & Ghanizadeh, 2011). In this research, Moafian and Ghanizadeh (2011) found a significant association between university students' (majoring in English) self-efficacy and CT. Comparing the findings of the three studies (Moafian & Ghanizadeh, 2010; Moafian & Ghanizadeh, 2011; and the current study) which have been conducted under a similar topic, it is revealed that in the studies whose participants have been teachers, the same results have been acquired whether they teach in language institutes or at high schools. In contrast, in the study in which students comprised the participants, contradictory findings were achieved. As a tentative explanation, the researchers suppose that some other variables, not yet known to them, may intervene. Seemingly, the subjects' profession is one of them. It seems that as self-efficacy is task-specific, its relationship with a second variable is also task-specific and situation-bound. As the results indicated, considering the situation, in the position of a teacher, the relationship was not found between CT and self-efficacy; in contrast, in the position of a learner, a significant relationship was detected between the two variables.

The second research question addressed the relationship between English language teachers' CT and EQ at high schools. The results revealed that there is a significant relationship between teachers' CT and their EQ. The yielded result substantiates Elder's (1996) contention

regarding the association between thought and feelings. Elder argued that the human mind is composed of, at least, three main functions, namely, cognition, feelings, and volition. While processing is in progress, these three functions, though theoretically distinctive, have a dynamic and intimate relation to each other. Thinking is always associated with some related feeling and drive; accordingly, feeling co-occurs with related thinking and drive, and the same holds true for drive. The finding is also in line with Berg's (2008) view concerning the relation between cognition and affect. Berg believes that separation between these two mental mechanisms is not correct and the interaction is beneficial to both. "Cognition without emotional motivation is meaningless and emotions should be re-harnessed through cognition" (Berg, 2008, p. 94). Similarly, de Bono (1982, p. 99) argues that "in the end all thinking is emotional ... In the end our decision, choices and courses of action are all determined by emotions, feelings and values. The purpose of thinking is to serve us as human beings, and feelings are the best judge of the effectiveness of that service." (cited in Moon, 2008).

One important point to consider is the susceptibility of human judgments to partiality and bias toward previous beliefs (cultural, racial, or social desirability bias, to name only a few). CT involves judgment and, in an educational setting, judgments should be intelligent and biasfree as far as possible. To take academically valid decisions, teachers as one group of the influential judges should wisely exercise control over their emotions and harness them in order not to lead and be led astray by their emotions and biases at the expense of reality. Here, the necessity of the existence of EI emerges. Teachers who possess a high level of EI are not under the influence of immediate feelings and emotions which in turn leads to bias and partiality towards a special idea or group. Such teachers, as the term EI indicates, very intellectually and logically recognize their own feelings and those of the ones whom they are in contact with towards the issues associated with educational environment, and via the process of regulating these emotions, guide them in a manner that they gain the best results. Therefore, it seems that the behaviors of such teachers in comparison to those of their colleagues with low levels of EI are more conducive to gaining a sound CT and the precious consequences.

However, it is worth noting that the positive size of correlation of .30 obtained in this study demonstrates a moderate association between CT and EI. This is not far from expectation considering the wide array of other variables that may influence teachers' CT level.

The particular importance of finding such a relationship (though moderate) between CT and EI resides in the fact that both variables are connected with teachers' effectiveness in their profession (Birjandi & Bagherkazemi, 2010; Hashemi, 2008). While the existence of high levels of EQ and CT promotes the probability of occupational effectiveness among teachers, it seems logical that their simultaneous presence leads to positive reciprocal influence on one another which culminates in gaining higher levels of professional success.

Based on the findings of the study, among the fifteen components of EQ, assertiveness and problem solving had the highest positive correlations with teachers' CT. Assertiveness, that is, the ability to express one's feelings, beliefs, thoughts and to defend one's right (Bar-On, 2000, cited in Hashemi, 2008), and especially academic assertiveness are crucial for CT

development (Barnett 1997; Barnett & Coate, 2005). Moon (2008) believes that academic assertiveness is necessary for teachers "to manage better their academic experiences, and specifically the CT demands of their programs" (p. 171). It appears that a teacher who is going to approach educational issues with a critically reflective perspective should possess the courage to express his/her views and beliefs comfortably; whenever s/he feels s/he is right and his/her ideas and opinions can bring remarkable and constructive changes in academic settings, s/he persists in and defends them until s/he gains access to his/her goals. Therefore, it can be concluded that assertiveness drives, convinces and enables teachers to take a critical stance toward the foundations of the eminent scholars in the field, educational materials which are used and, in general, the events that occur in educational contexts.

Regarding problem solving, reaching a significant positive association between CT and problem solving is hardly surprising. Depicted as thinking about thinking (Kuhar, 1998), "CT is megacognition that involves recognizing a problem and using cognitive process for problem solving" (Kuhar, 1998, p. 80). Giancarlo, Blohm and Urdan (2004) regarded problem solving as one of the four main dispositional aspects of CT. Contending the existence of six CT skills as interpretation, analysis, evaluation, inference, explanation and self-regulation, Facione (1990) argued that these CT skills are tied to higher-level thinking, decision making and problem solving. Willingham (2007) also stated that from the cognitive scientists' perspective, the intellectual activities labeled as CT are in fact a subset of three kinds of thinking: reasoning, making judgments and decisions, and problem solving.

CT causes teachers, while encountering a problem, to look at it from different dimensions; meanwhile, if they receive constructive ideas and thoughts that may even disconfirm their views, they open-mindedly accept (if it literally works better) rather than adamantly oppose any changes to their previous deeply seated sets of beliefs and rationally hold control of emotions (Willingham, 2007). As a result, they deal with problem solving process more effectively. Additionally, regarding intercultural and even intra-cultural differences (based on classroom dynamics which offers the notion that variety exists in classrooms in the same culture and even in a single classroom, not to mention that individuals are also always subject to change emotionally, and so forth), CT seems to drive teachers' pragmatism. Pragmatism in Oxford Advanced Learner's Dictionary (2005, p. 1182) has been defined as "thinking about solving problems in a practical and sensible way rather than by having fixed ideas and theories". 'The pragmatics of language pedagogy' has been defined by Widdoson (1990) as "working out of reflexive interdependent relationship between theory and practice, between abstract ideas driving from various areas of inquiry and their actualization in the achievement of practical outcome" (p. 30). Consequently, teachers can be more confident about the soundness of following what leading figures in the field theorize, bereft of too much concern about probable backfire. On the other hand, a teacher's experience in pragmatically solving problems unique to one's classroom seems to further CT.

The third, fourth and fifth research questions examined the roles of gender, age and teaching experience as moderating factors in the relationship between teachers' CT and EQ. The findings demonstrated that none of the predicted moderators had a significant influence on the relationship between CT and EQ. This suggests that regardless of gender, age or teaching

experience, teachers' CT is associated with their EQ. Consequently, it can be argued that EQ is a significant predictor of CT even after controlling for the effects of gender, age and teaching experience.

## 5. Conclusion

As it went at the beginning of the article in progress, in the world of language teaching and learning, theoreticians sometimes commit lapses despite their utmost care and effort, since to err is human; the occasional scientific rejections of some theories have proved this matter to be inevitable. Teachers, as the major mediator between theoreticians and students have to be equipped by a tool to refine those findings, taking into account each specific feature of their dynamic classrooms and students, first and foremost culture. As an educated guess, researchers of this study presumed CT as the panacea; thus, the objective of the study was to find the possible relationship between CT and the two presumed reinforcers, i.e., self-efficacy and EQ. Since CT and self-efficacy are cognitive constructs, and EI is an affective one tinged with cognition, possibly an affective-cognitive construct, it seems plausible to discover a relationship in between.

The results of the data analysis indicated a significant relationship between CT and EQ, though CT relationship with self-efficacy was rejected and no moderating roles for gender age and teaching experience were discovered.

The implication of the study is that, considering the obtained significant correlation between CT and EQ, investing more in developing teachers' EQ, along with informing the teachers about it, furthers CT. Consequently, a well-cultivated critical thinker well prevents possible misfires. A course on EQ for pre-service and in-service teachers may help enhance the situation. As a final comment, a secondary advantage of such a situation might be reducing the pressure on theoreticians to prolifically theorize without too much concern about the irreparable consequences caused by shortcomings.

Nevertheless, the limitations of the study should be taken into account. The participants of the study were merely English high school teachers. The study can be conducted for high school teachers teaching other subject matters. Concerning the association between CT and EQ, to the researchers' best knowledge, this is the first attempt to empirically explore the relationship between teachers' EQ and CT; therefore, the study should be replicated to find out whether identical results can be achieved. Regarding the findings of the research done by Moafian and Ghanizadeh (2010), Moafian and Ghanizadeh (2011), and also the present research in which CT was found related to self-efficacy for students but not for teachers, the tentative link between CT and self-efficacy provided by these researches makes it worthy of note, and a meticulous repetition of the research in a broader context with a wider range of samples is recommended in order to settle this area of contradiction.

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