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EFL Learners' Self-regulation, Critical Thinking and Language Achievement

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Abstract

The study reflected in the present paper investigated the relationship between Iranian EFL learners' self-regulation, critical thinking ability and their language achievement. The researchers of the present study set out to investigate this association based on theoretical contention in the literature postulating a dynamic interplay between self-regulatory skills and critical thinking ability as well as empirical studies demonstrating the association of each of these constructs with academic achievement. To the researchers' best knowledge, there is hardly any documented study exploring the relationship between these constructs among EFL learners. To attain the purpose of the study, 82 EFL university learners were selected according to a convenience sampling from different universities in Mashhad, a city in the north-east of Iran. They were requested to complete the "Watson-Glaser's Critical Thinking Appraisal" and the "Self-Regulation Trait Questionnaire". They were also asked to indicate the grade point average of their previous term. The data supported the theoretical expectation of a linkage between self-regulation and critical thinking. Subsequent data analyses indicated that among the components of self-regulation, *self-monitoring* and *self-efficacy* have the highest correlations and are the positive predictors of critical thinking. In addition, the results demonstrated that EFL learners' self-regulation can predict about 53 % of their language achievement while their critical thinking ability tends to predict about 28% of achievement. The conclusions and recommendations derived from the present study should encourage

educators to take advantage of these relationships by developing effective paths for developing EFL university students' self-regulation and critical thinking.

Keywords: Critical thinking, EFL learners, Language achievement, Self-regulation

1. Introduction

Self-regulation refers to "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2000, p. 14). In the domain of education, self-regulatory skills have been found to be associated with academic success and motivation to achieve educational goals (Zimmerman & Schunk, 2001). According to Zimmerman (1990), self-regulated students are motivationally, behaviorally and metacognitively active participants in their learning process. Concerning motivational processes, these students exhibit diligence and persistence in their learning and have high levels of self-efficacy and intrinsic interest. As far as behavioral processes are concerned, they opt for environments that optimize learning and are involved in self-instruction and self-reinforcement. In their metacognitive processes, self-regulated learners set goals, self-monitor, and self-evaluate their learning processes which enable them to be self-aware and decisive in their learning approach (Zimmerman, 1990). It is apparent that self-awareness and self-evaluation are associated with the individuals' reasoning and reflective thinking, i.e., critical thinking (CT) ability.

American Philosophical Association Project defined CT as "purposeful, 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). Proponents of CT skills have convincingly argued that developing thinking skills must be a compelling priority for educationalists. A substantial theoretical and empirical base now exists in the literature to demonstrate the association of CT with students' academic success (among them are Lee & Loughran, 2000; Keeley, Holland, & Watson, 2005). The contention is that higher-order thinking skills enhance higher order learning skills leading to academic achievement (Renner, 1996).

The major aim of the present study is to empirically examine the theorized association between self-regulation and critical thinking among EFL learners. The researchers of the present study set out to investigate this association based on logical reasoning stated above as well as theoretical contention in the literature postulating a dynamic interplay between self-regulatory skills and critical thinking ability (Phan, 2010). To the researchers' best knowledge, there is hardly any documented study exploring the relationship between CT and self-regulation expect for the one conducted by Ghanizadeh (2011). In this study, the researcher examined the relationship between EFL teachers' self-regulation and their CT skill in Language Institutes. To this end, 92 EFL teachers completed the "Watson-Glaser Critical Thinking Appraisal" and the "Teacher Self-Regulation Scale ". The results of data analysis revealed that there is a significant relationship between the two variables in question.

Besides, an examination of self-regulation and CT literature as well as the models and theories of effective learning inspired the researchers to postulate that there must be a positive association between EFL learners' achievement and each of these constructs.

2. Review of the Related Literature on CT

According to different scholars in this field, there is a wide range of definition for CT. For instance, Siegel (1988) introduces CT as "the educational cognate of rationality" (p.32). He identifies two rather different concepts of CT: the 'pure skills' (p.6) and the 'skills plus tendencies' (p.6). According to him, the 'pure skills' concept of critical thinking completely focuses on a person's capability to properly evaluate or assess definite sorts of statements. Therefore, according to this view, a person can be a critical thinker, if s/he has the skills, or proficiencies needed for the suitable evaluation of statements. However, as Siegel (1988) noted, this conception is imperfect because it ignores the salience of the real operation of these skills and capabilities in a person's day by day life. The influence of this CT concept on the educational context could be less confident if students took part in CT tests only in order to obtain good scores in exams but not outside the testing situation.

Lipman (1991) believes that CT is a healthy skepticism, whereas Norris and Ennis (1989) describe it as "reasonable and reflective thinking that is focused upon deciding what to believe and do" (p.3). Elder and Paul (1994) assume that CT is the capability of thinkers to be responsible for their own thinking process and increases the reasonable criteria for analyzing and evaluating their own thinking. Maiorana (1992) stresses that the function of CT is to attain understanding, assess viewpoints, and solve problems.

In a similar way, Halpern (2003) introduces CT as "the use of those cognitive skills or strategies that increase the probability of a desirable outcome….thinking that is purposeful, reasoned, and goal oriented" (p.6). Also, Bensley (1998) defines it as "reflective thinking involving the evaluation of evidence relevant to a claim so that a sound conclusion can be drawn from the evidence" (p.5). Diestler (2001) believes that CT is "the use of specific criteria to evaluate reasoning and make decisions" (p.2). Furthermore, Levy (1997) defines CT as "an active and systematic cognitive strategy to examine, evaluate, understand events, solve problems, and make decisions on the basis of sound reasoning and valid evidence" (p. 236).

Davidson (1998) believes that if one examines these definitions, large areas of overlap can be seen. In fact these definitions are somehow paraphrases of the same concepts. They simply relate CT to a coherent judgment.

Despite the multitude of definitions for CT, there is a general consensus among educationalists that learning to think critically is one of the key objectives of formal schooling (Keeley, Holland, & Watson, 2005). Similarly, CT is known as one of the important competences for students to attain in academic language situation (Connolly, 2000; Davidson, 1998; Davidson & Dunham, 1997). Furthermore, Kress (1985) believes that CT is a social phenomenon and is in fact language itself. Therefore, even more than L1 teachers, L2 teachers have reasons to introduce the aspects of CT to their students because if they do not, their students may have difficulty when they are encountered with the essential of thinking critically, especially in an academic situation (Davidson, 1998).

It is worth mentioning that educators in approximately three areas of second language acquisition have determined the CT capabilities required for academic work (Pally, 2000). For instance, English for Academic Purpose (EAP) emphasizes that students should be able to reach English language proficiency in different areas such as: cause and effect, description, categorization, and specifically for comparison and contrast. EAP also emphasizes the strategies of skimming, scanning, and the ability to use the symbolic conventions of academic or professional disciplines. Cognitive psychology focuses on the understanding of the rules of temporal succession, cause and effect, judgment, and choice (Mohan, 1986, 1990; Vygotsky, 1962; Widdowson, 1990).

Critical pedagogy emphasizes the examining of "the deep meanings, personal implications, and social consequences of any knowledge, theme, technique, text, or material…its internal structure and its connections to self and society" (Shor, 1992, p. 169).

The crucial aim of teaching CT is to aid learners make proper judgments on the basis of the cautious weighing of existing facts. On the other hand, CT is a very complicated enterprise. Buskist and Irons (2008) declare that such a venture requires students to learn numerous subtasks which consist of, among others:

a. Increasing a cynical approach to problem solving and decision making;

b. Solving various problems with simplest outcomes;

c. Finding proof that supports and refutes a given end;

d. Establishing a watchful approach toward their personal predisposition, assumptions, and standards that may obstruct to make an objective resolution.

3. Review of the Related Literature on Self-regulation

In recent times, extensive body of research in the field of educational psychology is paying attention to the exploration of the ways in which motivational and cognitive elements of academic learning work jointly. One major research element within this domain consists of the investigation of academic self-regulation.

Zimmerman (2000) considered academic self-regulation as the extent to which learners are motivationally, metacognitively, and behaviorally dynamic in their learning procedure and in achieving their aims. Therefore, it is concluded that students are active participants in their own learning process. In fact, self-regulation consists of monitoring, management and control of cognition, motivation, behavior, and surroundings. (Wolters, Pintrich, & Karabenick, 2003).

In many recent studies, it has been observed that self-regulation is strongly related to academic achievement. For instance, in a research done by Zimmerman and Martinez-Pons (1986) self-regulated learning strategies such as reviewing text, environmental structuring, seeking information, and goal settings were found to significantly facilitate the students' achievement. Furthermore, it was found that high achievers used self-regulatory procedures more than low-achievers. Likewise, Ee, Moore, and Atputhasamy's (2003) study showed that

high achieving learners had better traits to consider and employ self-regulatory strategies which were absolutely associated with their achievement. Additionally, Pintrich, Smith, Garcia, and McKeachie (1993) illustrated that elements of self-regulation together with motivation and use of a variety of cognitive and metacognitive strategies and achievement were all considerably interrelated with each other.

Generally speaking, self-regulated students who are motivationally, behaviorally, and metacognitively active in their own learning, probably achieve high levels (Risemberg & Zimmerman, 1992). These learners monitor their learning in opposition to their aims via different strategies and organize their time and study surroundings efficiently. They are mostly optimistic about their capabilities and future success (Dembo & Eaton, 2000). It has also been found that the structures of classroom and educational environment should encourage student autonomy and responsibility in the learning process. Students should be able to make choices and feel that they have control over their learning (Sunger & Gungren, 2009). Furthermore, classroom structures focusing on individual improvement and mastery are suggested to help the development of adaptive motivational beliefs (Ames, 1992).

The trends observed with self-regulation seem to pertain to the teachers' realm. It has been reported that teachers who are more self-regulated can better manifest teaching effectiveness (Monshi toussi, Boori & Ghanizadeh, 2011). In other words, teachers' self-regulatory skills tend to have a positive role in successful accomplishment of their professional tasks. In a similar vein, teachers' self-regulation has been found to be associated with their sense of self-efficacy beliefs. Ghonsooly and Ghanizadeh (2011) revealed that the more EFL teachers equip themselves with the self-regulatory skills, the more capable they judge themselves in their teaching practice.

4. Purpose of the Study

The major purpose of the present study is to empirically examine the hypothesized association between CT and self-regulation among EFL university students. The study also seeks to investigate the relationship of EFL university students' academic achievement with CT and self-regulation. To this end, the following research questions were posed and investigated in the present study:

1) Is there any relationship between EFL university students' CT and self-regulation?

2) Among the components of self-regulation which one(s) is/are the positive predictor(s) of their CT?

3) Is there any relationship between EFL university students' academic achievement and CT?

4) Is there any relationship between EFL university students' academic achievement and self-regulation?

5. Method

5.1 Participants

82 Iranian EFL university learners participated in this study. There were 57 females and 25 males. Their ages varied from 20 to 33 years old (M = 22.21, SD = 2.51); 12 participants did not specify their age. They were senior students who were studying English Literature and English Teaching at Ferdowsi and Azad universities of Mashhad, respectively.

5.2 Instruments

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

To evaluate teachers' critical thinking ability, the *Watson-Glaser Critical Thinking Appraisal* (CTA) (Form A) was employed. This test comprises 80 items and consists of 5 subtests as follows:

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.

The reliability of *the Watson-Glazer t*est has been determined in three ways: the estimates of the test's internal consistency, the stability of the test scores over time and the correlation between the scores on the 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, indicates an acceptable level of stability (0.73). Regarding validity, the Watson-Glaser test enjoys all areas of face, content, criterion and construction validity. 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 this study, the total reliability of the questionnaire was calculated via Cronbach's alpha which was found to be 0.78.

5.2. 3 Self-Regulation Trait (SRT) Questionnaire

To measure self-regulation, the *self-regulation trait* (SRT) questionnaire designed by O'Neil and Herl (1998) was utilized. It consists of 32 Likert-scale questions ranging from *almost never*, to *sometimes*, *often*, and *almost always.* The scale seeks to measure metacognition and motivation dimensions. Each dimension comprises two sub-scales. Meta-cognition covers the constructs of planning and self-monitoring, and motivation contains effort and self-efficacy. The four scales are measured by 8 Likert-type items each. The following table depicts the subscales of the SRT:

Table 2. The subscales of SRT along with the corresponding descriptions.

Factor		**Definition**
Metacognition	*Planning*	The extent to which one has an assigned or self-directed goal and a plan to achieve the goal.
	Self-monitoring	The extent to which one needs a self-checking mechanism to monitor goal achievement.
Motivation	*Effort*	The extent to which one works hard on a task.
	Self-efficacy	The extent to which one has confidence in being able to accomplish a particular task.

According to Herl et al (1999), the reliability and validity of the scale have been verified in multiple studies. In this study, the total reliability of the questionnaire calculated via Cronbach's alpha was found to be 0.86.

5.3 Data Collection

The study was conducted at Azad and Ferdowsi universities of Mashhad, a city in the north east of Iran. The participants were asked to complete the *Self-Regulation Trait* questionnaire and the *Watson-Glaser Critical Thinking Appraisal*. The questionnaires were coded numerically and they were asked not to write their names. They took the questionnaires home, completed and during the following weeks submitted them to the researchers. They were also asked to indicate the grade point average (GPA) of their previous term. Since the participants were already briefed on the purpose of the study and given that all participants were guaranteed anonymity and confidentiality, it was hoped that these would add the validity to

the students' report of their academic average. As an incentive, the participants were given the opportunity to receive feedback about their performance on the instruments by presenting their codes.

5.4 Data Analysis

To ensure the normality of the distribution, descriptive statistics was employed. To determine the relationship between learners' CT and their self-regulation, a Pearson product-moment correlation was conducted to the data. To find out which components of self-regulation might have more predictive power in predicting learners' CT, a multiple regression analysis was run. To determine the relationships of learners' achievement with their self-regulation and CT, the Pearson product-moment correlations were run. To explore what percent of variability in learners' achievement can be explained by taking their self-regulation and CT into account, the standard multiple regressions were run.

6. Results

Table 3 summarizes the descriptive results of the two instruments- the *Self-Regulation Trait* questionnaire (SRT) and the *Watson-Glaser Critical Thinking Appraisal* (CTA) - utilized in this study as well as GPA. (See Table 3)

Table 3. Descriptive statistics of SRT, CTA, and GPA.

	N	**Minimum**	**Maximum**	**Mean**	**Std.Deviation**
SRT	82	61.00	121.00	91.64	14.08
CTA	82	25.00	65.00	48.56	8.35
GPA	82	13.00	18.25	15.39	1.21

To investigate the relationship between EFL learners' CT and their self-regulation, a Pearson product-moment correlation was applied. The results of correlation revealed that there is a significant correlation between CT and self-regulation ($r = 0.61$, $p < 0.05$). (See Table 4)

Table 4. The results of correlation between EFL learners' CT and their self-regulation

	Total self-regulation
Total CT	0.615*

* Correlation is significant at the level of 0.05

It was also found that there is a significant relationship between EFL learners' CT and the four subscales which compose the total self-regulation scores as follow: CT and planning ($r = 0.422$*, $p < .05$), self-monitoring ($r = 0.619$*, $p < .05$), effort ($r = 0.459$*, $p < .05$), and self-efficacy ($r = 0.623$*, $p < .05$) (See Table 5).

Table 5. The results of correlation between subscales of self-regulation and CT.

	CT
Planning	0.422*
Self-monitoring	0.619*
Effort	0.459*
Self-efficacy	0.623*

To investigate which components of self-regulation might have more predictive power in predicting learners' CT and how other constructs contribute to this model, a 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 6).

Table 6. The ANOVA table of regression

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	**Regression**	2333.847	4	583.462	13.531	.000[a]
	Residual	3320.348	77	43.121		
	Total	5654.195	81			

Predictors: (Constant), Planning, Self-monitoring, Effort, Self-efficacy
Dependent Variable: CT

As Table 7 displays, among the four subscales of self-regulation, *self -monitoring* and *self-efficacy* were found to be the positive predictors of the dependent variable (CT).

Table 7. The results of regression analysis for learners' self-regulation and CT.

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	**(Constant)**	19.661	6.916		2.843	.006
	Planning	.257	.371	.080	.693	.491
	Self-monitoring	.530	.358	.286	1.581	.043
	Effort	-.081	.364	-.030	-.223	.824
	Self-efficacy	.539	.310	.346	1.736	.037
a. Dependent Variable: CT						

To analyze the data further, regression analysis was conducted. The results indicated that learners' total score of self-regulation is a positive predictor of the dependent variable (CT) (See Table 8).

Table 8. The results of regression analysis for CT and self-regulation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.110	4.901		3.116	.003
	Self-regulation	.365	.052	.615	6.979	.000

Dependent Variable: CT

Table 9 illustrates the model summary statistics. The results revealed that the model containing the total scores of self-regulation can predict 37 percent of the EFL learners' CT. The R value is 0.61 which indicates the correlation coefficient between self-regulation and CT. Its square value is 0.37. It indicates that about 37% of the variation in learners' CT can be explained by taking their self-regulation into account (See Table 9).

Table 9. R square table for self-regulation as the predictor of CT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615[a]	.378	.371	6.628

a. Predictors: (Constant), Self-regulation

To decide the relationship of EFL learners' achievement with self-regulation and CT, the Pearson product-moment correlations were utilized. The results of correlations revealed that there are significant correlations between CT and GPA ($r = 0.53^*$, $p < 0.05$) and between GPA and self-regulation ($r = 0.73^*$, $p < 0.05$) (See Table 10).

Table 10. The results of correlations between EFL learners' GPA, CT and self-regulation

	GPA
Total CT	0.534*
Total Self-regulation	0. 733*

* Correlation is significant at the level of 0.05

To determine what percent of variability in EFL learners' achievement can be accounted for by taking CT and self-regulation into account, regression analyses were run. As table 11 indicates the model containing the total score of CT can predict 28 percent of the EFL

learners' achievement and the model holding total score of self-regulation can predict 53 percent of the EFL learners' achievement.

Table 11. R squares for self-regulation and CT as the predictors of achievement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615[a]	.378	.371	6.628
2	.234[b]	.285	.276	1.0380

a. Predictors: (Constant), Self-regulation
b. Predictors: (Constant), CT

7. Discussion

The primary purpose of this study was to examine the possible relationship between EFL learners' CT and their self-regulation. The researchers of the present study set out to investigate such a relationship based on the current models and theories of learning suggesting that there is an elaborate interplay between these two higher-order abilities. For instance, Phan (2010), incorporating these two theoretical orientations within one framework, postulated that that "critical thinking, as a cognitive practice, helps in self-regulation in learning and teaching" (p. 288). He also contended that the elaborate interaction between these two facets contributes to individuals' growth and development. Zimmerman (1990) also asserted that abilities associated with evaluation and reflective thinking can be considered as self-regulatory components in learning processes.

The findings of the present study are also in accordance with empirical studies. Kupier (2002) noted that the enhancement of self-regulatory strategies leads to the development of CT abilities. In a similar vein, Leung and Kember (2003) found positive relations between CT and motivational variables such as self-regulation, goal orientations, and self-efficacy beliefs. In an EFL context, Ghanizadeh (2011) indicated CT ability has a facilitative role in enhancing EFL teachers' self-regulation over time. The study revealed that among the CT components, *interpretation* and *evaluation of arguments* have the highest correlations with teachers' self-regulation. Based on the results of the present study, it appears that the same also goes for EFL learners. That is to say, the promotion of EFL learners' CT will have a positive influence on their self-regulation and the more the EFL learners endeavor to develop CT skills, the more self-regulated they will be in their learning.

The researchers' second question aimed at finding which components of EFL learners' self-regulation have the highest correlations with their CT and which ones are the positive predictors of CT. The results revealed that *self-monitoring* and *self-efficacy* have the highest correlations and are the positive predictors of CT. The relationship between *self-monitoring* and CT suggests that the learners' use of self-checking mechanism to monitor their own thinking and learning processes facilitates their ability to evaluate the values of viewpoints

and reasoning. This seems plausible in the view of the fact that both of these variables are evaluative and interpretive in nature and both belong to higher-order thinking skills. Besides, scrutinizing the proposed definitions of CT as well as the conceptual frameworks related to CT would demonstrate that a trace of self-checking mechanisms is discernible in almost most approaches to CT. Elder and Paul (1994) postulated that a fundamental perquisite of critical thinking is the capability of thinkers to be responsible of their own thinking process and to develop reasonable criteria for analyzing and evaluating their own thinking. In defining the attributes of critical thinkers, Facione and Facione (1996) incorporated self-monitoring (self-examination and correction) as one of the major cognitive skills of critical thinkers. This implies unless the students are capable of monitoring their own thinking and learning processes, they may not adequately develop the abilities associated with CT.

The correlation of CT to *self-efficacy* indicates that individuals who have stronger beliefs in their abilities to successfully perform academic tasks are also better critical thinkers. This is in line with theoretical contentions which indicated there is an interactive association between abilities associated with CT and self-efficacy beliefs (Bandura, 1997, 2001; cited in Phan, 2010). Phan's (2010) theoretical framework of self-regulation and reflective thinking suggests that the subprocesses involved in these two constructs (including self-efficacy and CT) coexist and interact in a dynamic fashion. In addition to theoretical confirmation, the results of the present study are consistent with empirical studies, though they are quite sparse. Kuiper (2002) reported that the development of CT will contribute to the ambiguity tolerance, responsibility taking, confidence and self-efficacy enhancement. In L2 context, Moafian and Ghanizadeh (2011) found a significant relationship between EFL learners' CT and their sense of efficacy beliefs. They attributed this finding to the positive influence of CT on learners' academic achievement. This feeling of success, they contended, might enhance learners' beliefs in their capabilities, since mastery experience (previous success) is the most influential factor in shaping individuals' self-efficacy beliefs.

The researchers' third question aimed at investigating the relationship between EFL learners' self-regulation and academic achievement. The results indicated there is a significant relationship between the two variables and EFL learners' self-regulation can predict about 53 % of their achievement. This is hardly surprising since, as indicated earlier, a plethora of studies demonstrated that self-regulated learners were generally higher achievers and more motivated to achieve educational goals in comparison with their counterparts with less self-regulatory skills (e.g., Zimmerman & Schunk, 2001; Ee, Moore, & Atputhasamy, 2003; Schunk & Pajares, 2001). Based on the results of the present study, it appears that the contributing role of self-regulatory skills in academic achievement also generalizes to EFL contexts and among EFL learners. That is to say, the more EFL learners attempt to be motivationally, behaviorally, and metacognitively active in their own learning, the higher they achieve.

The researchers' fourth question examined the relationship between EFL learners' CT and academic achievement. The results demonstrated a significant relationship between the two variables. It was also revealed that EFL learners' CT can predict about 28% of their achievement. This is consistent with a substantial theoretical and empirical base in the

literature demonstrating the association of CT with students' academic success (e.g., Lee & Loughran, 2000; Kealey, Holland & Watson, 2005). In a similar vein, the findings of the present study confirm previous L2- related research indicating that CT is one of the central competences for L2 learners to achieve language learning success (Connolly, 2000; Davidson, 1998; Davidson & Dunham, 1997). It seems CT skills enhance higher order learning skills leading to higher levels of language proficiency (Renner, 1996). This finding can also be explained in the light of the context of the present study, i.e., university domain. There is a general consensus among educationalists that developing CT skills of university students must constitute an indispensable part of the agenda of higher education. Scholars in the field of higher education contended that CT is a standard of intellectual excellence required for full and constructive participation in academic, individual and social lives of students (Scriven & Paul, 2004).

In essence, the findings of this study provide practical implications and suggestions for EFL teachers, educators and administrators to pinpoint effective paths for developing critical thinking and self-regulation among EFL students. According to Facione and Facione (1996), every program targeted at developing CT at higher education must encompass these components: *truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity* (cited in Jarvis, 2005). Teachers, in particular EFL teachers, are recommended to develop and integrate the abilities associated with CT in the classroom context via procedures such as assigning controversial topics for discussion and witting, encouraging divergence and reflectivity, reinforcing inference-making, and making them familiar with procedures that promote CT such as portfolio, concept mapping and journal writing. Furthermore, self-regulation can be structured through participation in environments that provide students with opportunities to be in control of their own learning (Zimmerman, 2000).

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