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Dynamic Interplay of Critical Thinking and Vocabulary Learning Strategies Among Iranian EFL Learners with the Moderating Role of Gender

Maryam Soleimani[1], Zahra Aghazadeh[2,*], and Amin Bolourchi[3]

[1] Assistant Professor in Applied Linguistics, Farhangiyan University, Urmia, Iran,
ORCID: 0000-0002-4540-088X   Email: m.soleimani.1361@gmail.com

[2] Corresponding Author: Ph.D. in Applied Linguistics, Ministry of Education, Salmas, West Azarbaijan, Iran,
ORCID: 0000-0002-4877-8140   Email: zahra.aghazadeh.zm@gmail.com

[3] MA in Applied Linguistics, Ministry of Education, Urmia, West Azarbaijan, Iran
ORCID: 0000-0002-0523-1209   Email: amin.bolourchi@yahoo.com

Abstract

Critical thinking (CT) is extensively considered to be a prevalent notion in teaching and learning processes. Thus, this paper set out to pinpoint the association between EFL pupils' CT capabilities as well as their vocabulary learning strategies (VLSs) across gender. To do this, 140 Iranian male and female intermediate students studying at Iran Language Institute (ILI) in Urmia, Iran were chosen randomly. The study was conducted in the form of a survey with data being gathered via using Preliminary English Test (PET) to homogenize the students, Schmitt's VLSs questionnaire to recognize the kinds of the strategies employed by students, as well as Ennis' Cornell Critical Thinking Test (CCTT) to ascertain the students' CT capabilities. The data was subjected to analysis using the Pearson correlation. The findings indicated a significant association between CT abilities and VLSs. Furthermore, male learners showed more CT skills and VLSs compared to female students. Thus, identifying the students' preferred VLSs would help them overcome the difficulties in learning words. Also, instructors should design classroom activities that encourage learners' reflective thinking.

Keywords: Critical Thinking, EFL Learners, Gender, Vocabulary Learning Strategies

Introduction

Vocabulary acquisition is a decisive element in Second Language (L2) learning as it enables learners to comprehend and produce language efficiently (Tayler, 1990). Differently stated, having a favorable grasp of vocabulary is essential for learners in achieving high levels of proficiency in a foreign language and communicating more effectively (Boers & Lindstromberg, 2008). It is commonly accepted that the development of a comprehensive lexicon plays a crucial role in language learning and improves effective communication skills (McCrostie, 2007); therefore, there is a growing body of research and teacher attention focused on vocabulary development (Zu, 2009). As it is axiomatic, vocabulary plays a great role in determining students' efficiency in four language skills. Students' inadequate lexical knowledge leads to difficulties in comprehension and language development (Shen, 2008). As Krashen and Terrell (1983) state, vocabulary has a primary function in communication and inability in comprehending the meaning of words used by others can hinder individuals from participating in conversations.

The notion of critical thinking was originally introduced by Socrates more than two millennia ago; however, it is widely acknowledged that modern critical thinking tradition was established by the American philosopher, John Dewey (1909, cited in Fisher, 2001). Dewey's conceptualization of CT encompasses a meticulous examination of a belief taking into account the underlying justifications and the subsequent implications it entails. Building on Dewey's conception, Glaser (1941) clarified critical thinking as an attitude characterized by a disposition to thoughtfully consider the problems that one faces, an understanding of the techniques of systematic investigation and logical deduction, along with specific expertise in implementing those approaches.

CT is a compelling factor in higher education (Golden, 2023) and a major concern in mainstream education (Gelder, 2005). As a consequence, enhancing learners' CT ability can empower them to make informed decisions and employ effective strategies for language acquisition, particularly vocabulary learning. While the enhancement of students' abilities to think critically is highly appreciated by instructors, there appears to be a dearth of focus in this regard in developing countries (Khalili, et al., 2004). For instance, in Iranian EFL context, there is a prevalent belief that students are just passive receivers of information and the teachers act as the authority in the classrooms and prefer to give lectures and present their knowledge and expertise to the students (Heydarnejad et al., 2021). Consequently, it implies that CT abilities improvement receives inadequate priority in this context.

Learning L2 vocabulary has myriad difficulties which can be overcome by teachers' special instruction. However, VLSs are not explicitly taught in most EFL classes, and unfortunately students attempt to learn vocabulary by themselves without receiving any guidance or instruction. Besides, learners choose LLSs based on various factors, including age, gender, motivation, learning style along with CT abilities (Nikoopour et al., 2011). Although there are numerous courses available for various L2 skills, courses that focus on vocabulary rarely exist (Ghezelseflou &

Seyedrezaei, 2015). Moreover, in EFL classes, there is often a greater focus on teaching grammar and pronunciation than on vocabulary (Fernandez et al., 2009), despite the fact that vocabulary is deemed crucial for acquiring both native and foreign languages (Morra & Camba, 2009). Neglecting lexicon can hinder students' ability to achieve remarkable attainment as it is a key element in language learning and should not be taken for granted (Boers & Lindstromberg, 2008). Furthermore, most of the research studies on VLSs have focused on vocabulary presentation and memorization and more emphasis was laid on the strategies related to memory (Gu & Johnson, 1996). Most learners use mechanical strategies, including repetition to learn complex words (Schmitt & McCarthy, 1997). The fundamental role of vocabulary in language acquisition cannot be neglected, since it functions as the cornerstone for effective communication and the advancement of other language skills. However, according to Hunt and Beglar (2005), there is a scarcity of research studies conducted on VLSs.

Regarding the role of gender in determining CT, some studies have revealed that men and women have disparate approaches to thinking and acquiring knowledge (e.g., Clinchy, 1994; Miller et al., 1990). Although gender has a great impact on CT and VLS, the number of studies is rare and more investigation in this realm is needed. Consequently, improving students' CT competencies could potentially exert a noteworthy impact on their overall linguistic progression and more specifically, their acquisition of lexicon.

To recapitulate, the previous studies investigated language learners' use of VLSs in general (e.g., Al-Omairi, 2020; Alqarni, 2018; Ghalebi et al., 2020, 2021; Thiendathong & Sukying, 2021). Moreover, Ravandpour (2022) investigated the relationship between EFL learners' CT, learning engagement, flipped learning readiness and autonomy. As a corollary, the eminence of the study lies in the fact that no study before has appraised the interplay between CT and VLSs among Iranian EFL students by taking gender into consideration all in one study. This is a virgin and pristine territory upon which more studies are needed.

Literature Review

Vocabulary Learning Strategies

Inspired by language learning strategies (LLSs), Gu (2003) and Schmitt (1997) introduced VLSs as the sub-category of LLSs. It is appropriately substantial for EFL learners to possess them to acquire the essential lexicon (Nation, 2001). According to Nation (2001), the application of VLSs can empower language learners to assume greater accountability for their own learning process. Many researchers stressed the prominence of VLSs use from different points of view. For instance, Oxford (1990) emphasizes that in their process of learning a language, learners should be encouraged to take advantage of strategies. In the same vein, Cameron (2001) identifies VLSs as certain activities that facilitate the students' comprehension and retention of vocabulary.

In the past few years, researchers (Sadeghi & Farzizadeh, 2013; Barzegar & Rahimi, 2012) have directed extra attention towards diverse methods for instructing vocabulary. In a classroom context, vocabulary training should be emphasized since a strong lexical repertoire is essential for effective language learning. Hence, researchers have proposed divergent methodologies, encompassing the employment of tangible artifacts, visual representations, as well as translation. However, Schmitt (2000) contends that explicit instruction may not be an efficacious method for teaching vocabulary. While explicit instruction may be beneficial for elementary learners, other methods may be more effective for more advanced learners (Schmitt, 1997).

The previous studies (e.g., Al-Omairi, 2020; Alqarni, 2018; Ghalebi et al., 2020, 2021; Thiendathong & Sukying, 2021) investigated language learners' use of vocabulary learning strategies in general and the impact of learners' levels on the use of such strategies. For instance, Ghalebi et al. (2020) investigated EFL learners with different levels of academic degrees to figure out how they differ in using VLSs. The outcomes demonstrated significant differences between undergraduate and postgraduate students' usage of VLSs. Moreover, Ghalebi et al. (2021) examined the differences between Iranian high and low English vocabulary learners in terms of using VLSs. The findings showed significant differences between high and low English vocabulary learners' usage of determination, memory, cognitive, and metacognitive strategies. However, there was no significant difference in their use of social strategies. Therefore, to the researchers' best of knowledge, there are scarcity of research studies conducted on the relationship between Iranian EFL learners' VLSs and CT taking gender into consideration.

Critical Thinking

Critical thinking is widely regarded as a fundamental skill and a crucial determinant of an individual's accomplishments in the contemporary era (Luk & Lin, 2015). There is no pleasant educational context without the concept of CT. Thereupon learners ought to be motivated to engage in critical thinking activities. Correspondingly, teachers should support learners to develop CT by providing opportunities in educational settings (Mohammadi Forood & Khomeinjani Farahani, 2013). Dewey (1933) elucidated CT as a form of reflective thinking that involves considering an opinion actively and persistently. Smith (2003), on the other hand, refers to it as a kind of high-level thinking. Simply put, CT enables students to go beyond their own perspectives and engage in a thorough analysis of the data (Celuch et al., 2009). According to Bandyopadhyay and Szostek (2019), critical thinkers are capable of assessing the reliability and accuracy of what they read and hear. In addition, they are open-minded and analytical, that is, they can interpret and analyze information effectively (Bandyopadhyay & Szostek, 2019). Moon (2007) asserts that the acquisition of CT abilities can be facilitated through explicit instruction and emphasis within educational settings. According to Emir (2009), any educational setting should strive to help the students accomplish higher levels of thinking and become reflective thinkers. As explicated by Mahyuddin et al. (2004), learners who can ponder critically in a vocabulary class are more likely to achieve the curriculum objectives and use their CT abilities for a lifelong learning.

The ability to engage in critical analysis is generally regarded as an indispensable life skill (Galinsky, 2010). Many psychologists and educators state that it is regarded as one of the most striking thinking abilities that learners should acquire and is one of the major goals of any educational setting (Morra & Camba, 2009). However, it was observed that in Iranian context, students are not able to think critically (Khalili et al., 2004). Correspondingly, the dominant objective of any pedagogy needs to be enhancing learners' critical thinking skills to achieve autonomy and independence (Barzegar & Rahimi, 2012). Likewise, Weiler (2005) emphasizes the significance of CT in the learners' learning and cognitive development. Additionally, teaching CT is complicated for many teachers since a broad array of approaches offered for its instruction (Schmaltz et al., 2017). According to Mendelman (2007), due to the prevalence of passive activities including video games, internet, and TV in children's lives, teaching CT skills remains a fundamental practice in the classroom.

Recently, some studies have explored EFL instructors' and learners' attitudes toward the principles of CT (e.g., Sadeghi et al., 2020; Zhang et al., 2020; Zhang & Yuan, 2022; Zhang & Yuheng, 2023). The outcomes of these studies revealed that EFL teachers concurred that the infusion of CT into the EFL syllabus and classroom teaching is indispensable. Moreover, Ravandpour (2022) investigated the relationship between EFL learners' CT, learning engagement, flipped learning readiness and autonomy. Furthermore, Heydarnejad et al. (2021) examined the relationship between CT, self-regulation, and teaching style preferences among EFL teachers. However, investigating the relationship between Iranian EFL learners' VLSs and CT taking gender into consideration is a rarely touched topic in Iranian EFL context.

Empirical Studies

Regarding the studies in this field, Sharafi-Nejad et al. (2016) examined the effectiveness of critical thinking on 60 male undergraduate EFL students' vocabulary learning in Malaysia. The participants in experimental group were instructed on how to employ critical thinking strategies on vocabulary learning. The results of the post-test showed that the experimental group who received formal instruction based on the critical thinking strategies revealed the prominent development and interest in vocabulary learning. In the same vein, Farahanynia and Nasiri (2016) explored the correspondence between lexical inference as well as CT and they disclosed that the group with higher CT abilities achieved outstanding success in lexical inference tasks.

Similarly, Abadi and Baradaran (2013) conducted research on the association between VLSs use by the pupils and their level of autonomy. The results confirmed that more autonomous learners used more VLSs. In the same vein, Boroushaki and Ng's (2016) study revealed a compelling interconnection between 75 Malaysian postgraduate students' CT ability and VLSs. Besides, the study conducted by Changwong et al. (2018) as well as Hove (2011) demonstrated that teaching and practicing CT strategies explicitly in high school can develop learners'

academic performance. Furthermore, Shirazi and Heidari (2019) evaluated the interrelation among the learning styles of nursing students, their CT abilities, and their intellectual accomplishments. They concluded that students' CT skills score was low, indicating a need for greater emphasis on CT in academic lesson planning.

Regarding gender differences, Liu et al. (2019) conducted a study concerning the impact of gender on CT as well as critical behavior within the population of Taiwanese nursing pupils. The results highlighted that both masculinity and caring behaviors were positively correlated with nursing students' critical thinking abilities. Nonetheless, Walsh and Hardy (1999) investigated critical thinking measures among various university majors across gender. The findings revealed that females achieved higher scores compared to males in terms of open-mindedness and maturity. Similarly, Zetriuslita et al. (2016) observed that females outperformed males in certain high-level CT abilities that involve the identification of concepts and the analysis of algorithms. However, Marni et al. (2020) sought to assess the authenticity of tools utilized for measuring critical thinking and examined the variations in critical thinking abilities among students based on gender and level of knowledge. The findings suggested that there wasn't any discernible inconsistency in CT abilities among gender groups or levels of knowledge. Likewise, Bagheri and Ghanizadah (2016) explored the influence of gender on the two constituent elements of critical thinking, and one constituent element of self-regulation. It was determined that gender did not have any impact on critical thinking subcomponents, and self-monitoring.

As Nour Mohammadi et al. (2012) state, the effect of CT on language learning is worth investigating. Nevertheless, most studies in this domain have focused on the effect of CT on the utilization of learning approaches by learners in general (e.g., Faravani, 2006; Barjesteh & Vaseghi, 2012). Furthermore, very few attempts (e.g., Boroushaki & Ng's, 2016; Sharafi-Nejad et al., 2016) have been made to obtain a comprehensive understanding of the relationship between VLSs and CT and if investigated at all, most have been done on a small scale of participants; that is, 75 postgraduate and 60 male undergraduate students with different fields of study in Malaysian university context.

Therefore, the number of studies evaluating the relationship between learners' VLSs and CT in Iranian EFL context is meager. Moreover, the current query pinpoints the relationship between 140 Iranian EFL learners' VLSs and CT across gender in a private language institute which is different from university context and to the best of our knowledge, no such exploration has hitherto been carried out to delve beneath this particular issue. It is noteworthy to mention that the aforementioned studies did not take gender into account, which is thoroughly pertinent to the ultimate focus of this paper. In addition, despite huge investments of effort and resources put into learning foreign languages in Iran, many students still struggle with learning and remembering vocabulary. In sum, the interplay between CT abilities and VLSs among Iranian EFL learners is to a large extent unresolved and a limited quantity of research has examined the construct of CT in EFL settings. The present study signifies a progressive stride in the quest to explore the degree of

congruity between critical thinking and vocabulary learning strategies. Thereby, this inquiry endeavors to tackle the subsequent research queries:

1. Is there a relationship between CT abilities and VLSs choice among Iranian male EFL learners?
2. Is there a relationship between CT abilities of Iranian female EFL students and their VLSs choice?
3. Is there a statistically significant difference in CT abilities across gender?
4. Is there a statistically significant difference in VLSs use across gender?

Method

Design

The methodology adopted in the present scrutiny was of associational nature. A correlation is simply defined as a relationship between variables. Specifically, this inquiry endeavored to probe the correspondence between CT and VLSs among EFL students, with a focus on gender variations.

Participants

140 intermediate EFL students (70 male and 70 female) at Iran Language Institute (ILI) in Urmia, West Azarbayjan took part in the examination. The participants were selected in a random manner out of a pool of 180 intermediate learners. Their mother tongue was either Persian or Turkish and as an international language, they were studying English. Likewise, the participants' selection was according to the results of the PET test, and the participants were in the age span of 16 and 20 years old.

Materials and Instruments

The current investigation employed the subsequent instruments.

Preliminary English Test (PET)

PET was implemented to gauge the individuals' English language proficiency at an intermediate level. It measures language skills and consists of 67 items, i.e., auditory comprehension with 25 components, written expression with 7 components, and textual comprehension with 35 components. Its dependability was determined to be 0.81.

Ennis' (1985) Cornell Critical Thinking Test (CCTT)

In this study, CCTT designed by Ennis (1985) was utilized to evaluate students' critical thinking abilities. It comprises 52 multiple-choice items and was disseminated after a pilot test to ensure its reliability. The questionnaire's credibility was established to be 0.80. This questionnaire was examined by several EFL professors to ensure its content validity. It also enjoyed convergent validity of .72.

Schmitt's (1997) Vocabulary Learning Strategies Questionnaire (VLSQ)

Schmitt's VLSQ was applied in the present investigation that encompassed 41 items on a Likert format to assess learners' VLSs. The questionnaire was piloted and obtained the reliability of 0.78. This questionnaire was assessed by several EFL experts to ensure its content validity. It also enjoyed convergent validity higher than .60.

Procedure

Data collection tools encompassed two questionnaires, namely Ennis' (1985) Cornell Critical Thinking Test (CCTT) questionnaire including 52 items and Schmitt's (1997) VLSs scale which includes 41 items. Before using the questionnaires in the main study, the researchers piloted the questionnaires to ensure that they were reliable enough. The findings indicated a high reliability for both of them. Moreover, the questionnaires were examined by the EFL experts to ensure their content validity. Both scales enjoyed higher validity indices. During the study, through PET test, a cohort of 140 pupils with an intermediate level of proficiency, comprising 70 female and 70 male learners, was chosen from a population of 180 individuals who obtained scores of 1SD higher and lower than the mean. The researchers distributed the questionnaires among the participants at ILI in Urmia, West Azerbaijan for gathering data. First, Ennis' (1985) CCTT questionnaire was given to the participants who had approximately an hour to complete it. Subsequently, Schmitt's (1997) VLSQ survey was disseminated among the identical individuals the next session and they were given 45 minutes to provide their responses.

Data Analysis

The researchers conducted a Kolmogorov-Smirnov Test to assess the normality of the sample. Then they used an independent-samples t-test to ensure the homogeneity of the individuals. To investigate the interdependence between CT skills and VLSs among Iranian EFL pupils across gender, the investigators employed Pearson correlation. Finally, to identify any variations between male and female groups with respect to CT as well as VLSs, t-tests were carried out.

Results

Quantitative Data Analysis for Normality of the Population

The researchers evaluated the normality of the sample. The outcomes showed that the sample was normally distributed (p=.14>.05).

Quantitative Data Analysis for homogeneity of the Participants

Initially the researchers administered the PET test to 180 pupils. As a result, 140 students (i.e., 70 females and 70 males) were selected the scores of whom were 1SD higher and lower than the average. The researchers employed a t-test to validate the absence of any notable variation between the female participants (*M*=41.08 *SD*=4.47) and their male counterparts [*M*=40.89, *SD*=3.00; *t* (138) = .06, *p*=.76> .05]. This suggests that both groups were homogeneous in nature, as indicated by the mean scores (see Table 1).

Table 1

T-Test for PET Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	11.09	.00	.30	138	.76	.18	.622	-1.043	1.416
Equal variances not assumed			.30	138	.76	.18	.622	-1.044	1.418

Quantitative Data Analysis for the First and Second Research Questions

The investigators used Pearson correlation to examine the interconnection between CT and VLSs among males and females. Accordingly, the outcomes are displayed in Table 2.

Table 2

Descriptive Statistics for CT and VLSs Among Males and Females

Gender		Mean	Std. Deviation	N
Males	CT	85.89	5.490	70
	VLSs	85.26	5.705	70
Females	CT	60.56	6.014	70
	VLSs	58.26	5.551	70

As can be seen, Table 3 indicates a significant connection between CT as well as VLSs among males [r = .97, n=70, Sig= 0.00<0.01] and among females [r = .85, n=70, Sig= 0.00< 0.01]. Therefore, the first and second hypotheses stating that there is no relationship between CT abilities and the choice of VLSs among male and female EFL students are rejected.

Table 3

Pearson Correlation Between CT and VLSs Among Males and Females

Gender			CT	VLSs
Males	CT	Pearson Correlation	1	.975**
		Sig. (2-tailed)		.000
		N	70	70
	VLSs	Pearson Correlation	.975**	1
		Sig. (2-tailed)	.000	
		N	70	70
Females	CT	Pearson Correlation	1	.856**
		Sig. (2-tailed)		.000
		N	70	70
	VLSs	Pearson Correlation	.856**	1
		Sig. (2-tailed)	.000	
		N	70	70

**. Correlation is significant at the 0.01 level (2-tailed).

Quantitative Data Analysis for the Third Research Question

The researchers performed a t-test to appraise and contrast the mean score of male and female participants with reference to their CT abilities. A notable dissimilarity existed in scores for males (*M*=85.89, *SD*=5.49) and females [*M*=60.56, *SD*=6.01; *t* (148) = 26.9, *p*=.00 < .05], that is, males were more critical thinkers than females. Thereby, the third hypothesis which stated that there is not any remarkable disparity between the CT abilities of different genders has been disproven (see Table 4).

Table 4

T-Test for the Difference Between Females and Males Regarding Their CT Ability

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.294	.58	26.9	138	.00	25.33	.940	23.4750	27.1915
Equal variances not assumed			26.9	138	.00	25.33	.940	23.4749	27.1917

Quantitative Data Analysis for the Fourth Research Question

The study compared the VLSs scores of male and female participants using a t-test. A differentiation in the scores was detected for males (*M*=85.26, *SD*=5.70) and females [*M*=58.26, *SD*=5.55; *t* (148) = 26.3, *p*=.00 < .05], that is, males used VLSs more than females. Thereupon, the fourth hypothesis stating that there is not any notable disparity between the VLSs employed by males and females is hereby refuted (see Table 5).

Table 5

T-Test for the Difference Between Females and Males Regarding VLSs

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.028	.867	29.3	138	.00	27.00	.9192	25.1835	28.8164
Equal variances not assumed			29.3	138	.00	27.00	.9192	25.1835	28.8164

Discussion

This paper delved into the correspondence between CT and choice of VLSs among Iranian EFL pupils taking into consideration gender differences. The results revealed a positive interrelation between CT and VLSs across gender. These results support a preceding inspection done by Nikoopour et al. (2011), which indicated that the application of LLSs could enhance learners' CT. Furthermore, the findings align with Sharafi-Nejad, et al. (2016) investigation which revealed that Malaysian male undergraduate EFL learners with advanced CT skills outperformed those with limited CT abilities in vocabulary learning.

By the same token, the outcomes are consistent with prior researchers' (Farahanynia & Nasiri, 2016) result which indicated a noteworthy correlation between lexical inference and CT determining that the students with superior critical thinking skills accomplished exceptional triumph in lexical inference assignments. Moreover, the outcomes share a number of similarities with Boroushaki and Ng's (2016) findings, which indicated a significant correlation between Malaysian postgraduate students' CT skills and VLSs. Besides, the findings are in accordance with Fahim and Komijani's (2010) research, which indicated that students who had exclusive CT skills tended to exploit a range of strategies including memory, determination, cognitive, and meta-cognitive to enhance their learning. This means learners with higher CT ability were more independent in making decisions and solving problems and more creative in generating innovative ideas. Thus, CT is a pivotal conception ascertaining the achievement of language learners as L2 learning necessitates the utilization of higher-order cognitive abilities (Liaw, 2007). To put it another way, teachers can develop the learners' language performance by employing CT into language learning process.

Regarding the disparities observed between male and female learners related to CT and VLSs, the outcomes indicated male learners' superiority. Obtained results are in contrast with studies conducted by Walsh and Hardy (1999) as well as Zetriuslita, et al. (2016), which manifested higher scores among females in comparison with males in CT measures, including high-level CT skills. Additionally, Bagheri and Ghanizadah's (2016) study found no significant gender variations in CT measures. Moreover, the research conducted by Marni et al. (2020) revealed no observable incongruity in CT capacities between different gender groups or levels of expertise. Nevertheless, the findings of the present inspection are in conformity with a scrutiny carried out by Liu, et al. (2019) that underscored a positive association between masculine traits and nursing pupils' CT capabilities.

The learning environment, including teaching methods, curriculum design, and classroom culture, can contribute to the observed disparities. If instructional approaches primarily cater to the learning styles or preferences of male students, it may disadvantage female learners. Additionally, biases in assessment methods may favor certain skills or approaches that align more closely with male learning styles. It's crucial to recognize that individual differences play a significant role in performance outcomes. There is considerable variation in aptitude, interests, and learning styles within each gender that can contribute to the observed disparities.

Conclusion

Taking into account the language learning in EFL contexts, it is necessary that the students be prepared for the world beyond their own context. CT is the most fundamental concept in language education. According to Rezaei, Derakhshan, & Bagherkazemi, (2011), it is essential that learners learn the required thinking skills and enhance their CT ability during L2 learning in order to express themselves clearly and cope with the outside world. Thus, enhancing the learners' CT abilities as well as regulating their thinking processes can have a remarkable impact on their language acquisition on the whole. To recapitulate, developing students' CT capability will help them to make their own decisions and follow their own learning strategies in language learning process. To this end, the current paper aimed at exploring the association between students' CT abilities and VLSs. By the same token, the study intended for uncovering the gender variations with regard to the application of VLSs and CT abilities. The findings exemplified a significant association between CT abilities and VLSs. Furthermore, male learners showed more critical thinking skills and VLSs compared to female students.

The present findings have important pedagogical implications. Identifying the students' preferred VLSs would help them overcome the difficulties in learning words. Moreover, teachers can help learners develop the strategies that motivate them and help them become more independent and accountable to accomplish their language acquisition goals. As Zimmerman (2000) expresses it so eloquently, "because to their higher motivation and adaptable learning strategies, self-regulated kids are not only more likely to achieve academically, but also more positive about their future." (p. 66). In addition, instructors should educate students to select the strategies suitable for their language needs and provide them with beneficial tasks to develop their vocabulary knowledge. As Paul and Elder (2005) state, "the only capacity we can use to learn is human thinking. It can be concluded that the utilization of critical thinking skills would help EFL students learn L2 vocabulary more effectively and profoundly." (p.10)

Regarding CT, the current examination indicates the imperative capacity of CT in enhancing self-determination of the learners in the process of acquiring a new language. It behooves language instructors to design classroom activities that encourage active student participation, such as reflective thinking, questioning, discussion, and self-evaluation. Consequently, students will obtain confidence and self-determination in communications. Applying CT in course books can motivate students to effectively apply CT skills to their academic studies (Kealey, Holland, & Watson, 2005). Considering the impact of CT on learners' vocabulary knowledge, Ayhan and Payan's (2023) study indicated a high correlation between the students' CT ability and L2 vocabulary knowledge.

The outcomes of the current study concern educators in TTC programs, to provide the EFL instructors with the required atmosphere and impetus to guide the class in the right path by employing the most appropriate teaching materials and methods according to the principles of CT since increasing EFL instructors'

knowledge regarding the notions of CT will, no doubt, give rise to the improvement in quality of teaching and consequently accomplishment in successful learning.

Unfortunately, instruction, in Iranian EFL context, is centered upon a traditional teaching paradigm; therefore, pupils are not instructed to think critically. Similarly, the instructor's duty is just to cover the instructional materials rather than enhancing learners' reflection on learning materials. Instructors should help passive learners to become active participants. Additionally, they should provide opportunities for the low critical thinkers to learn the CT skills (Fahim & Ahmadian, 2012). The outcome of this research evinces the necessity of renewing the current syllabi and curricula regarding CT principles by consulting all stake-holders. Consequently, it can be concluded that CT principles should have more room to be applied in the curricula and syllabi in English language schools.

On the whole, the novelty of the present investigation has opened up opportunities for upcoming researchers to thoroughly examine the congruence of CT in the EFL setting with the aim of refreshing the instructional resources and methodologies, in order to enhance the EFL educational framework for the forthcoming generation. In a nutshell, the results are hoped to facilitate the functioning of the educational system, resulting in effective consequences for curriculum developers, educators, and learners. This can be achieved by incorporating the findings into the university curriculum, potentially motivating instructors to reevaluate their teaching methods and align their instruction with the principles of CT.

As with any research study, the present exploration has a number of shortcomings. The most consequential limitation resides in the utilization of a small sample size, potentially compromising the credibility as well as applicability of the outcomes. To obtain more accurate outcomes, further investigations with larger sample sizes are required to validate our findings. It is recommended that subsequent inquiries need to be undertaken on the current topic in various contexts and proficiency levels. Finally, future studies are needed to scrutinize the present issue by employing data collection tools other than questionnaires including think-aloud protocols, observations, as well as diaries to guarantee the dependability and authenticity of the results. Moreover, future researchers can explore the impact of different instructional approaches such as teacher-centered approaches versus student-centered approaches on the development of critical thinking skills and the choice of vocabulary learning strategies. Furthermore, future researchers can examine how cultural factors influence the relationship between critical thinking, vocabulary learning strategies, and gender among Iranian EFL pupils. They can consider conducting cross-cultural comparisons to gain a broader perspective. Additionally, future researchers can investigate whether learners who excel in critical thinking in vocabulary learning also demonstrate enhanced critical thinking abilities in other language skills, such as reading, writing, and speaking. Besides, it is recommended that future researchers conduct longitudinal studies to explore the development of critical thinking skills and vocabulary learning strategies over time. Finally, they can investigate how critical thinking skills relate to the use of metacognitive strategies in vocabulary learning.

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Authors' Biography

Maryam Soleimani has PhD in Applied Linguistics from Urmia University and she has served as the assistant professor in Farhangiyan University since 2018 and as a full-time teacher at Iran Language Institute since 2006. Her recent publications have appeared in *Innovation in Language Learning and Teaching (Indexed in Scopus), Iranian Journal of Language Teaching Research (Indexed in Web of Science and Scopus), Asian ESP Journal (Indexed in Scopus), PASSA (Indexed in Scopus), and International Journal of Research in English Education (ISC Indexed Journal).* She is a member of editorial board in *Iranian Journal of Language Teaching Research* as well.

Zahra Aghazadeh has Ph.D. in Applied Linguistics from Urmia University and she is a full-time English language instructor in Ministry of Education in Iran. Moreover, she has been teaching general English language courses for undergraduate levels at Urmia University for 4 years. Her recent research has appeared in *Journal of Teaching English as a Second Language Quarterly (Formerly Journal of Teaching Language Skills) (ISC Indexed Journal), Iranian Journal of Language Teaching Research (Indexed in Web of Science and Scopus), and Journal of Language and Education (Indexed in Web of Science and Scopus).* Her main research interests are reading comprehension, collaborative learning, strategy-based instruction, first and second language acquisition, MALL, CALL, textbook evaluation, and material development. She has participated in various national and international conferences as well.

Amin Bolourchi has M.A. in Applied Linguistics from Allameh Tabataba'i University in Tehran. He received his B.A. in English Literature from Urmia University. He has been teaching English for more than 6 years in different institutes and schools, mainly, Jahad Daneshgahi and State schools. He is now a full-time teacher in the ministry of education. His fields of interest are applied linguistics, collaborative learning and vocabulary.