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## Research Article

# The Relationship between Critical Thinking Ability and Learning Styles of Iranian Male and Female EFL Learners

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### Abstract

This study seeks to investigate whether there is any significant relationship between critical thinking ability and learning styles of Iranian male and female EFL learners. In respect of this purpose, a critical thinking questionnaire and a VAK questionnaire were administered among 102 MA students majoring in English Teaching and Translation. The results disclosed that there is a significant relationship between critical thinking ability and total learning style. Moreover, with reference to obtained results, gender has a significant effect on learning style in that female learners would rather visual and kinesthetic learning style more than male ones, while male learners have more tendencies toward auditory learning style compared to female learners. These results may exhort teachers to get to know their students' learning style and synchronize their teaching with students' learning style. Besides, teachers can enhance the students' level of critical thinking ability through practice.

**Keywords:** Learning styles, critical thinking, visual learning, auditory and kinesthetic learning

### 1. Introduction

Learning is the center of attention in education as well as the sole goal. Due to the eminence of learning, what every teacher tries to make happen is learning. Talking about learning moves the attention to the ways that learning happens. Learning style is a prominent issue in educational setting. It goes without saying that individuals are unlike in terms of their learning styles; some people learn by seeing; some by thinking; some by saying and so on. "The ways in which an individual characteristically acquires, retains, and retrieves information are collectively termed the individual's learning style" (Felder & Henriques, 1995). Many scholars like Dunn & Dunn

(1979), Kolb(1981), and Felder & Silverman(1988) have proposed different classifications for learning styles.

Another substantial issue that is worth paying attention to is critical thinking, the nature of all human beings. Each individual thinks about every single matter and encounters some questions in respect of that matter to discern if it is logical or not. However, the level of critical thinking ability varies in different individuals. Critical thinking is “the ability to analyze, criticize, and advocate ideas; to reason inductively and deductively; and to reach factual or judgmental conclusions based on sound inferences drawn from unambiguous statements of knowledge or belief” (Freeley & Steinberg, 2000). Various papers and studies have discussed the issue of critical thinking in distinct perspectives such as the ways to improve critical thinking, the factors that affect critical thinking, the salience of critical thinking in life as well as education, and so on. The focus of this paper is to discern the relationship between critical thinking ability and learning styles of Iranian male and female EFL learners. Some similar studies have been done on the effect of learning style on critical thinking ability. The result of a similar study by Myers and Dyer(2006) on the influence of learning style on critical thinking skill showed that there is no significant inconsistency between the critical thinking skills of students across general learning styles for the students in that study. However, this study is going to see which learning styles are preferred by those who are considered as critical thinkers.

### **1.1. Learning style**

Getting to know the different learning styles is important in educational progress and academic success. Students can easily keep up with the syllabus and find their own Achilles heel so that they can excel in the course only if they recognize their own learning style. Gregorc(1979) described learning style as “consisting of distinctive behaviors which serve as indicators of how a person learns from and adopts to his/her environment. It also gives clues as to how a person’s mind operates” (p. 234). Witkin(1973) declared that a learning style influences a student’s preference for specific teaching strategies and learning environments. Therefore, learning style deals with the quality of learning not the quantity. Regarding the learning style there are some other concepts related to learning style like learning strategies and cognitive style. Learning style is an umbrella term that covers both learning strategies and cognitive style. Different learning styles have been proposed by many scholars like Kolb’s Learning Style Inventory (Kolb et al. 1979), Richard Felder and Linda Silverman Learning Style Model (Felder & Silverman, 1988) and many others.

Since people are diverse in terms of age, gender, ethnicity, nationality, cultural background, etc., their learning styles are varied. For example, older students who can draw from their life experiences are more inclined to be independent, self-directed learners (Knowles, 1980). Also, in the work of Belenky et al. (1986), there is substantial evidence to suggest that many women learn in more “connected” ways like collaboration, empathy and meticulous listening. Meanwhile Banks (1988) suggests that African-American students are more likely to work with others to reach the shared purposes (Banks, 1988).

The mismatches between teaching styles and learning styles may have some unpleasant outcomes. Students get bored and feel ignored in class and do poorly on tests and become desperate and may give way. Dunn (1984) found that students whose learning style matched with the teaching method and environment achieved better grades. Further, research has shown that students retain information longer, put the information in practice efficiently and feel positive towards the course content as long as teaching strategies and methods are in harmony with student learning style (Felder, 1993). Usually, there are many students in a class and each student has a distinct learning style. Nevertheless, it is on the teacher to implement various teaching styles to meet all the students’ learning styles. Other than that, using varied teaching styles instead of a single style will take the bore away from the classroom and makes it a better place for learning.

## **1.2. critical thinking**

The ability to think critically has been dealt with all around the world from many years ago and it still continues, but according to a plethora of researches, critical thinking ability in eastern countries is not as strong as that in western countries. The reason is due to the culture of these two poles of the world that are unlike. Critical thinking is the ability to analyze, criticize, and advocate ideas; to reason inductively and deductively; and to reach factual or judgmental conclusions based on sound inferences drawn from unambiguous statements of knowledge or belief (Freeley & Steinberg, 2000). Also critical thinking is defined as an everyday activity; whenever we want to make a decision, we go through a thinking process. Critical thinking is about asking questions; it increases the quality of memory because we are involved more closely with ideas (Nikoopour, Farsani & Nasiri 2011).

As Facione (2010) put it the approaches to life and living which characterize critical thinking comprises: curiosity as to wide range of issues, concern to become well-informed, self-reliance in one’s ability to reason, perception of the idea of others, even-handed in assessing

reasoning, and inclination to rethink and adapt views where honest reflection suggests that change is warranted.

Human beings are all sort of critical thinkers, but they are different from each other in their level of critical thinking and this can be enhanced by practice. Some factors are mentioned by many scholars that can affect critical thinking ability. These factors are learning style and teaching style. Young(1980) believed that if teachers implement proper instructional methods and materials, it will augment the students' critical thinking ability. As Paul(1990) put it, there are 3 categories of critical thinkers as critical readers, critical writers, and critical listeners. In Paul's point of view, critical readers go through the literature as a way to experience the writer's world, experience and point of view. In this case, critical readers do not simply traverse through the pages of a book. They question, challenge, interpret, mix and absorb what they read. Critical writers find it challenging to put their ideas and experiences into words. They find a parallel need to construct their own meanings as well as the probable meanings of their readers. Becoming a critical listener is the hardest part of critical thinking. If a person can get the nature of critical reading and writing, s/he can get the nature of critical listening. Moreover, all the challenges of reading and writing exist for a critical listener. However, being a critical listener is the most difficult one as we cannot return to the words of the speaker as we can when reading.

### **3. Method**

Considering all the aforementioned ideas about learning styles and critical thinking ability, the following research questions guided this study:

1. Is there any significant relationship between critical thinking ability and the learning styles of Iranian EFL learners?
2. Do the preferred learning styles of male and female critical thinkers differ?

In order to answer the aforementioned research questions, two questionnaires were administered among MA students of university and the correlation was done to see the existence of any significant relationship. The participants of this study were 102 male and female MA students with different age ranges majoring in English Translation or Teaching at Azad University in Tehran who voluntarily took part in this study. Each participant spent about 10 minutes to answer both questionnaires.

Honey (2000) prepared a critical thinking questionnaire which was administered to the participants of this study. It includes 30 items and the reliability of the questionnaire was

calculated by SPSS as .86, which is a good reliability. Also, Reid(1995) designed a VAK questionnaire used in this study to identify the participants' learning style. It has 33 items. The mode is 1.00, the variance is .86, and the sum is calculated as 454.00. The proven reliability of the two questionnaires was the main reason for the researcher to adopt them in this study.

The participants were given the VAK questionnaire prepared by Ried (1995) to show their learning style preference of visual, auditory or kinesthetic. After answering the VAK questionnaire, they were given a critical thinking questionnaire designed by Honey (2004). Then, the questionnaires of male and female participants were separated to see whether there was any significant relationship between the two variables or not. This study is a quantitative research and it has an ex post facto design in which the researcher does not have any control over the selection and manipulation of the variables.

#### **4. Results**

In order to come up with answer for both research questions, a Pearson correlation and a MANOVA were done respectively to probe the relationship between critical thinking ability of Iranian EFL learners and their learning styles and the difference between the learning styles of male and female students.

##### **4.1. Research question 1**

The first mentioned question of the study seeks to see if “Is there any significant relationship between critical thinking ability and the learning styles of Iranian EFL learners?”

The Pearson correlation coefficients are employed in order to probe any significant relationships between the critical thinking ability of the Iranian EFL learners and their learning styles. As displayed in Table 1 the Visual ( $r(100) = .37, P = .000 < .05$ ) and Auditory styles of learning ( $r(100) = .19, P = .046 < .05$ ) show significant correlations with Critical Thinking while the Kinesthetic learning style ( $r(100) = .12, P = .214 > .05$ ) does not show a significant correlation.

The total learning style shows a significant relationship with critical thinking ability of Iranian EFL learners ( $r(100) = .36, P = .000 < .05$ ). Based on these results it can be concluded that the answer to the first research question is positive.

Table 1: Pearson Correlations Learning Styles with Critical Thinking Ability

		VISUAL	KINESTHETIC	AUDITORY	Learning Style
CRITICALTHINKING	Pearson Correlation	.370**	.124	.198*	.364**
	Sig. (2-tailed)	.000	.214	.046	.000
	N	102	102	102	102
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

#### 4.2 Research question 2

The second mentioned question of the study seeks to see if “Do the preferred learning styles of male and female critical thinkers differ?”. A multivariate ANOVA (MANOVA) is run to probe any significant difference between the learning styles of male and female students. Before reporting the main results it should be noted that the assumption of homogeneity of variances – as tested through the Levene’s F-values – and the assumption of homogeneity of covariance – as tested through the Box’s test – are met. As displayed in Table 2 the probabilities associated with the Levene’s F-values are all higher than .05. Thus the assumption of homogeneity of variances is met.

Table 2: Homogeneity of Variances

	F	df1	df2	Sig.
visual	.006	1	100	.939
kinesthetic	3.442	1	100	.067
auditory	.018	1	100	.894

Besides enjoying homogenous variances the groups should enjoy homogenous covariance matrices. The Box’s M-value of 2.85 is not significant ( $P = .843 > .05$ ). Thus the assumption of homogeneity of covariance matrices is also met.

Table 3: Box's Test of Equality of Covariance Matrices

<b>Box's M</b>	2.855
<b>F</b>	.453
<b>df1</b>	6
<b>df2</b>	13501.758
<b>Sig.</b>	.843

Based on the results displayed in Table 3 it can be concluded that the gender of students has a significant effect on their learning styles ( $F(3, 98) = 3.06, P = .031 < .05$ , Partial  $\eta^2 = .086$  it represents a moderate to strong effect size). Thus the answer to the second research question is positive as well.

Table 4: Multivariate Tests Learning Styles by Gender

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
<b>Intercept</b>	<b>Pillai's Trace</b>	.991	3564.258	3	98	.000	.991
	<b>Wilks' Lambda</b>	.009	3564.258	3	98	.000	.991
	<b>Hotelling's Trace</b>	109.110	3564.258	3	98	.000	.991
	<b>Roy's Largest Root</b>	109.110	3564.258	3	98	.000	.991
<b>Gender</b>	<b>Pillai's Trace</b>	.086	3.069	3	98	.031	.086
	<b>Wilks' Lambda</b>	.914	3.069	3	98	.031	.086
	<b>Hotelling's Trace</b>	.094	3.069	3	98	.031	.086
	<b>Roy's Largest Root</b>	.094	3.069	3	98	.031	.086

The univariate statistics investigates the effect of the gender of the students on the three components of the learning style, i.e. visual, kinesthetic and auditory. Based on the results displayed in Table 5 it can be concluded that:

- The gender of the students has a significant effect on the preference of the visual learning style ( $F(1, 100) = 7.30, P = .008 < .05, \text{Partial } \eta^2 = .068$  it represents a moderate effect size). The female students with a mean score of 40.77 show a higher preference for visual learning style than the male students (mean = 37.96).
- The gender of the students has a significant effect on the preference of the kinesthetic learning style ( $F(1, 100) = 1.64, P = .20 > .05, \text{Partial } \eta^2 = .016$  it represents a weak effect size). The mean scores for the male and female students on kinesthetic learning style are 34.50 and 35.98.
- The gender of the students has a significant effect on the preference of the auditory learning style ( $F(1, 100) = .782, P = .37 > .05, \text{Partial } \eta^2 = .008$  it represents a weak effect size). The mean scores for the male and female students on auditory learning style are 33.34 and 32.38.

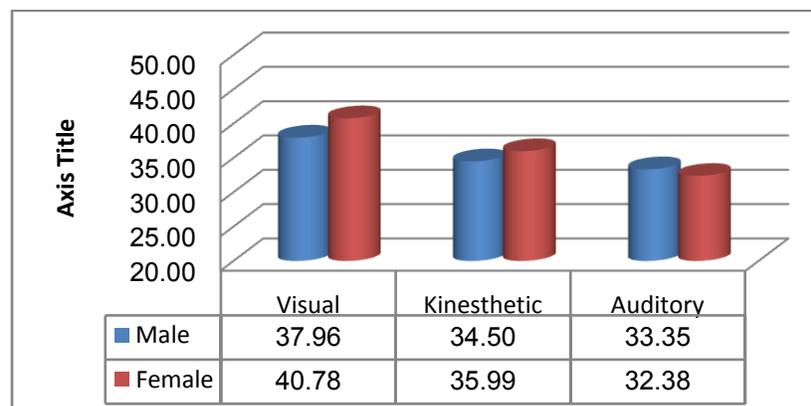
Table 5: Univariate Tests

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	VISUAL	153.488	1	153.488	7.308	.008	.068
	KINESTHETIC	42.827	1	42.827	1.649	.202	.016
	AUDITORY	18.024	1	18.024	.782	.379	.008
Error	VISUAL	2100.159	100	21.002			
	KINESTHETIC	2597.487	100	25.975			
	AUDITORY	2305.819	100	23.058			
Total	VISUAL	165934.000	102				
	KINESTHETIC	131968.000	102				
	AUDITORY	110908.000	102				

Table 6 displays the descriptive statistics for the male and female students on three learning styles.

Table 6: Descriptive Statistics Learning Style by Gender

Dependent Variable	Gender	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
VISUAL	Male	37.962	.899	36.178	39.745
	Female	40.776	.526	39.733	41.819
KINESTHETIC	Male	34.500	1.000	32.517	36.483
	Female	35.987	.585	34.827	37.147
AUDITORY	Male	33.346	.942	31.478	35.215
	Female	32.382	.551	31.289	33.474



Graph 1: Learning Style by Gender

## 5. Discussion

In the realm of language learning, specifically learning English as a second of foreign language, (Dabaghi, Zabihi, & Rezazadeh, 2013) believe that it is extremely influential to enhance the learners critical thinking due to the presence of historical, social, cultural and political issues.

Many studies have been done on the relationship between critical thinking and learning styles. But, the researcher could not find an exact similar study to her own measuring the relationship between critical thinking ability and VAK learning styles. Whatever found by the researcher so far considered learning styles different from the learning styles dealt with in this study.

A study carried out by Myers and Dyer(2006) on the influence of student learning style on critical thinking skills in university of Florida. The population of this ex post facto study was 135 students enrolled in a college of agriculture and life sciences leadership development course at the University of Florida. The learning styles measured in that study were Abstract Sequential, Concrete Sequential, Abstract Random, and Concrete Random. Results showed that no critical thinking skills differences existed between male and female students with deeply embedded Abstract Sequential learning style preferences exhibited significantly higher critical thinking skills scores. Also, no differences existed between students of other learning styles.

Another study was done on the relationship between critical thinking and language learning strategies among Iranian EFL learners by Nikoopour, Farsani and Nasiri(2011). That study was to investigate the relationship between critical thinking and the use of direct and indirect language learning strategies by Iranian learners. A critical thinking questionnaire and the Strategy Inventory for Language Learning(SILL) were administered among 100 college students majoring in English translation at Karaj University. The findings revealed a statistically significant relationship between specific direct and indirect language learning strategies such as cognitive, metacognitive, and social with critical thinking, while memory, compensation, and affective strategies appeared to have no relationship with critical thinking.

The purpose of the present study was to explore the relationship between critical thinking ability and the learning styles of male and female Iranian EFL learners. Contrary to other studies, the three learning styles used in this study were Visual, Auditory and Kinesthetic. Findings showed that there is a relationship between critical thinking ability and the learning styles of male and female Iranian EFL learners.

## **6. Conclusion**

As the data analysis shows, there is a positive relationship between learning style and critical thinking ability if the total learning style is considered as the focus of the study.

The data analysis revealed that there is a positive relationship between visual learning style and critical thinking ability. Also, there is a positive relationship between auditory learning style and critical thinking ability. But, there is no relationship between kinesthetic learning style and critical thinking ability. As a result, the answer to the first research question is positive.

Moreover, considering the analysis of the effect of gender on learning style, the results revealed that female learners had a greater tendency to visual and kinesthetic learning than male

learners. In contrast, male learners showed more tendencies to auditory learning than female ones. In this case, the answer to the second research question is positive as well.

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