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**ORIGINAL RESEARCH PAPER**

## Critical Thinking and Creative Thinking Skills and Language Learning Strategy Use of Iranian EFL Learners: with Focus on Language Proficiency Levels

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### ABSTRACT

#### Keywords:

Proficiency Development, Creative Thinking Skills, Critical Thinking Skills, Language Learning Strategy, EFL Learners.

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Learners' autonomy has become a growing topic of concern within educational contexts. This is because it is felt that there is an increasing need for developing higher-level cognitive skills such as creative thinking and critical thinking in students in order to enable them to handle their own learning process. The aim of this study is to investigate the relationship among three variables, namely creative thinking skills, critical thinking skills, and learning strategy use with focus on Iranian EFL learners' proficiency development through a survey research design. A total number of 169 Iranian students learning English were selected to complete three questionnaires on creative thinking, critical thinking skills and learning strategy use. The results of the study revealed that participants possess an acceptable level of creative thinking, but their critical thinking skills and learning strategy use were relatively poor. It was also shown through the test of correlation that proficiency development had a positive relationship with the three variables and that there were also positive correlations among three variables as well. Finally, results of standard multiple regression analyses manifested that the model consisting of creative thinking, critical thinking, and learning strategy can predict the proficiency development considerably.

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## 1. Introduction

The past decades have witnessed a significant shift in the field of language education, focusing less on teacher-centered and more on learner-oriented classroom instruction and placing greater emphasis on students and learning. Dörnyei (2005) argued that “learners' proactive contribution to enhancing the effectiveness of their own learning is essential in developing skills in learning how to learn” (p. 166). Consequently, many studies have been carried out to examine various factors affecting learners' autonomy (Sternberg, 2006; Brown, 2007). However, the literature shows relatively little research on learners' creative thinking skills, critical thinking skills and particular language learning strategies as three chief factors helping learners to be more autonomous and handle their own learning process.

Creative thinking skills, as defined by Torrance (1969), refer to the process of detecting a problem, searching for potential solutions, formulating hypotheses, testing and assessing the hypotheses, and sharing the results with others. Critical thinking skills which are believed to be the skills of importance for achievement at school and in life are helpful in helping the learner in terms of how to think instead of what to think. As for language learning strategies, they are “activities consciously chosen by learners for the purpose of regulating their own language learning” (Griffiths, 2007, p. 91).

So far, pertinent studies that have been carried out by second language acquisition scholars as well as cognitive psychologists have illustrated the effectiveness of three factors separately on learners' overall success (Ellis, 1994; Kasper 1997). However, it seems that there is a gap in research on the correlation of these three variables and their overall effect on learners' proficiency particularly in an EFL context like Iran. In this regard, the current study aims to explore Iranian EFL learners' attitudes towards creative thinking skills, critical thinking skills, and language learning strategy use to find any correlation between these skills and strategies with students' overall success.

## 2. Review of Literature

### 2.1 Creative thinking skills

Regarding creative thinking per se, different scholars have proposed different definitions for the concept. Vernon (1989) defines it as individual's ability to yield new or unique ideas, perceptions, inventions which are accepted by professionals as being of

scientific, aesthetic, social, or technological value. Sternberg and Lubart (1999) define creativity as "the ability to produce work that is both novel and appropriate" (p. 3). In educational contexts, creative thinking skills are believed to enable students to produce and develop ideas, to implement imagination, and to look for substitute innovative results. Seltzer and Bentley (1999) have also considered creativity as "the application of knowledge and skills in new ways to achieve a valued goal and this is ordinary to be obtained by all students" (p, 10).

Torrance (1969) described four constructs by which individual creativity could be assessed. These constructs are *fluency* or the ability to produce a large number of ideas; *flexibility* which is the ability to produce a large variety of ideas; *elaboration* which is the ability to develop, embellish, or fill out an idea and *originality* or the ability to produce ideas that are unusual, statistically infrequent, not banal or obvious.

## 2.2 Critical thinking skills

There are two main views on critical thinking. One view comes from cognitive and developmental psychology and the other from philosophy. Scholars of cognitive and developmental psychology often define critical thinking as focused thinking which is reasoned, and goal-directed. It is the kind of thinking comprised in formulating implications, solving problems, making decisions and calculating probabilities (Halpern, 1996). By contrast, definitions that draw upon philosophy often emphasize on the metacognitive component of critical thinking, and define it as "thinking about your thinking while you are thinking to make your thinking better" (Paul, 1993, p. 91). Similarly, Elder and Paul (1994) argue that critical thinking means that thinkers control their own thinking. Despite these different perceptions, however, it is now widely accepted that a suitable and operative definition of critical thinking needs to draw on both psychology and philosophy (Kuhn, 1992, 1999; Weinstein, 1995).

Watson and Glaser (2002) considered critical thinking as a combination of person's knowledge, behavior, and performance. They further suggested the following skills as critical thinking skills: *evaluation skill* (a skill to assess the reasonableness and quality of ideas and to judging the worth, credibility or strength of accounts); *inference skill* (a skill to identify possible information that is required for drawing conclusions), and

*analysis skill* (a skill to break down information or ideas in to its constituent parts and recombining it in different ways).

The ability to think critically, as it was mentioned, is based on intelligence which students do not essentially or inherently have, but it is an ability which can be taught in the classroom. Bean (1996) argues that “teachers must take a directive role in initiating and guiding critical thinking since it is considered a learnable skill” (p. 4). Particularly, language classes are mainly suitable for teaching critical thinking if there is richness of material and if interactive approaches to teaching are used.

### **2.3 Language learning strategies**

The existing literature on language learning strategies has proposed various definitions of the concept such as "the techniques or devices which a learner may use to acquire knowledge" (Rubin, 1975, p. 43); “specific action taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations” (Oxford, 1990, p. 8). More recently, Griffiths (2007) has defined strategies as “activities consciously chosen by learners for the purpose of regulating their own language learning” (p. 91).

As regards strategy classification, it was mostly proposed in terms of strategy impact, direct or indirect, on language learning (O’Malley et al., 1985; Rubin, 1981). Further, language learning strategies were distinguished as follows: *strategies of language use* (production and communication strategies), *language learning strategies*, and *skill learning strategies* (Tarone, 1988). Strategies were also classified as metacognitive, cognitive and social/affective categories (Chamot, 1987). Furthermore, strategies were grouped as memory, cognitive, compensation direct language learning strategies, and metacognitive, affective and social indirect strategies (Oxford, 1990).

### **2.4 Studies on creative thinking, critical thinking and learning strategy**

In a study of underachieving (UA) and overachieving (OA) elementary school students who were assessed as being gifted, Karnes *et al.*, (1961) found that creativity was related significantly to educational achievement. McCabe’s (1991) study also generally supported Karnes et al.’s findings. That is, in a sample of 126 seventh- and ninth-grade

girls, there was a positive relationship between high verbal and math IQ scores and high creativity.

Nikoopour, Amini-Farsani, & Nasiri, (2011) investigated the relationship between critical thinking and language learning strategies among Iranian EFL learners. They found a statistically significant relationship between 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.

Hou (2012) investigated the effects of critical thinking and strategy use on students' English performance. He examined 216 first year nursing students in a private college in south Taiwan by a set of General English Proficiency Test (CEF A2), and questionnaires dealing with students' critical thinking skills and learning strategies. Results showed that students' critical thinking skills and strategy use do relate to their English performance to some extent. In another similar study in EFL context, Nosratnia et al., (2014) explored the correlation between learners' language learning strategy use, and critical thinking. They surveyed 250 undergraduate students by Strategy Inventory for Language Learning (SILL) of Oxford (1990) and Critical Thinking (CT) questionnaire developed by Honey (2000). Results of multiple regressions showed that language learning strategy use and possessing critical thinking skills somehow affect learners' proficiency level.

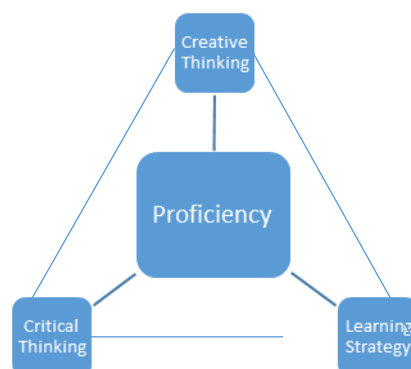
Nosratnia and Zaker, (2015) conducted a study on the relationship between predicting variables such as creativity (CR), critical thinking (CT), vocabulary learning strategies (VLS) and autonomy as the predicted variable. They found that there is a positive relationship between CR and CT, CR and VLS, CT and VLS. Also, CT is the best predictor of autonomy.

## **2.5 Conceptual framework**

Based on previous academic reviews, a conceptual framework is suggested for the current study, which inspires a systematic analysis of proficiency development by examining its correlation with students' creative thinking skills, critical thinking skills, and language learning strategy use, as shown in Figure 2.1. The conceptual framework demonstrates the influence of students' creative thinking skills, critical thinking skills, and language learning strategy use as independent variables on students' proficiency as

dependent variable. It also illustrates the inter-relationships of the independent variables.

**Figure 2.1**  
**Conceptual framework**



Moreover, a review of previous studies shows a few research gaps in this field. First, the research on the relationship among learners' creative thinking skills, critical thinking skills, and language learning strategy use are relatively rare, and the existing studies are likely to focus only either on one of the variables or only the correlation between two of them. Second, large-scale empirical studies of the topic are scarce, especially in the Iranian context. To fill in the gap, the current research explored Iranian EFL learner's reports on the correlation among creative thinking skills, critical thinking skills, and language learning strategy use with learners' general proficiency. Based on the objectives of the study and overall research design, the following research questions were posed:

1. Is there any relationship between critical thinking and creative thinking skills of Iranian EFL learners with focus on their proficiency levels?
2. Is there any relationship between critical thinking and language learning strategy use of Iranian EFL learners with focus on their proficiency levels?
3. Is there any relationship between creative thinking skills and language learning strategy use of Iranian EFL learners with focus on their proficiency levels?
4. Which components of critical thinking, creative thinking, and language learning strategy use predict the learners' overall proficiency levels? Which components are the best predictors?

### **3. Method**

#### **3.1 Participants**

This study involved 114 Intermediate and 55 advanced Iranian EFL learners from two major English language institutes in Birjand in Iran. There were 66 males and 103 females. These students were chosen out of around 200 volunteers based on a placement test. Participants were required to complete a 60-item placement test in order to obtain their actual competence in English language. Results of the placement test revealed that some participants were not really in intermediate and advanced level, so they were omitted from the data collection process.

#### **3.2 Instruments**

##### **3.2.1 Proficiency test**

As it was mentioned earlier, a quick 60 item placement test was administered on about 200 participants measuring their cognitive capacity as well as comprehension of English language texts. The first five questions examined learners' general understanding of some typical subjects. The rest of questions were either cloze tests or multiple-choice reading tests requiring participants to fill in the blanks by the use of given words.

##### **3.2.2 Torrance Test of Creative Thinking (TTCT)**

Torrance Test for Creative Thinking (TTCT) was used to examine creative features. The questionnaire includes 60 multiple choice questions in four main constructs of fluency, elaboration, originality and flexibility. The original English version of the questionnaire was first translated in Persian and then it was given to two language specialists to be checked for any possible errors. In order to improve the accuracy, the Persian version was back translated into English. Abedi (1993) has also used a similar Persian version of questionnaire for Iranian context and reported a total reliability of .86.

##### **3.2.3 Peter Honey's Critical Thinking (PHCT)**

Peter Honey's critical thinking survey was also employed in this study to examine the participants' critical thinking skills. The questionnaire consisted of 30 five-point Likert type questions followed by five alternatives including Never, Rarely, Sometimes, Often, and Always. Items in the questionnaire were divided into three main constructs of critical thinking as analysis, inference, and evaluation.

### **3.2.4 Strategy Inventory for Language Learning (SILL)**

Strategy Inventory for Language Learning (SILL) by Oxford (1990) was used to measure participants overall strategy use. SILL was developed based on Oxford's (1990) strategy classification with 50 questions on a five-point Likert scale from 'Strongly disagree' to 'strongly agree'. The instrument comprised six types of strategies in accordance with Oxford's (1990) taxonomy as: memory, cognitive, compensation, metacognitive, affective, and social learning strategies. A number of studies using SILL have reported an internal reliability between 0.91 and 0.95 (Oxford, 1996).

### **3.3 Data collection and analyses procedures**

The required data were collected in summer 2017 in two phases at regular English teaching hours with the assistance of the participants' instructors. During the first phase, participants were asked to answer the quick placement test which took about 30 minutes. As the second phase of data collection process, the three questionnaires were administered to participants. It took about 40 minutes to be completed. The collected data were analyzed through the application of *Statistical Package for the Social Sciences* (SPSS), version 19.0.

In accordance with the research questions, the analysis yielded descriptive statistics (mean and standard deviations) to examine the respondents' survey reports. The collected data were also analyzed through the application of Pearson product-moment correlation coefficient in order to explore any relationships among variables and their components. Moreover, standard multiple regression test was conducted to see how well the three independents' variables predict learners' overall proficiency level.

## **4. Results**

### **4.1 Reliability of survey**

Torrance Test of Creative Thinking (TTCT), Peter Honey's critical thinking (PHCT), and Strategy Inventory for language Learning (SILL) Questionnaires were analyzed for reliability in order to determine if the related items were internally consistent. In the current study, the Cronbach alpha coefficient of TTCT was estimated to be .74. The reliability coefficient for each construct of the questionnaire, namely fluency, flexibility, originality and elaboration was .75, .69, .81. and .71 respectively. The reliability analysis results for Peter Honey's critical thinking PHCT was .75. The reliability coefficient for each construct of the questionnaire was .83 (inference), .72 (evaluation),



and .77 (analysis). Finally, the reliability coefficient results for SILL was .94 and for each components of the survey it was .88 (memory), .96 (cognitive), .83 (compensation), .94. (metacognitive), .90 (affective), and .91 (social). The Cronbach's Alpha values were regarded as acceptable reliability coefficients. Table 4.1 shows the related data.

**Table 4.1**

Reliability Analysis results of Torrance Test of Creative Thinking (TTCT), Peter Honey's Critical Thinking (PHCT), and Strategy Inventory for Language Learning (SILL) Questionnaires

Survey Questionnaires	Cronbach's Alpha	Number of Items
Torrance Test of Creative Thinking (TTCT)	.74	60
Peter Honey's Critical Thinking (PHCT)	.75	30
Strategy Inventory for Language Learning (SILL)	.94	50

#### **4.2 The relationship between creativity (CR) and critical thinking (CT)**

Many educators and psychologists argue that CR and CT are closely associated, and they both amplify and foster higher-order thinking (Chamot, 1995; Kabilan, 2000; Sarsani, 2006). However, in order to systematically investigate the association between CT and CR among EFL learners, the following research question was posed as the first research question of this study:

Research question 1: *Is there any relationship between critical thinking and creative thinking skills of Iranian EFL learners with focus on their proficiency levels?*

In order for this study to answer this question, the data were analyzed by Pearson's product-moment correlation coefficient, results of which showed a significant and moderately positive correlation between the two variables,  $r = .31$   $n = 114$ , for intermediate students, while for advanced students there is no significant correlation between these two variables,  $r = -.23$   $n = 55$ .

#### ***4.3 The relationship between critical thinking (CT) and language learning strategies (LLS)***

It is believed that CT has a major influence on the process of learning (Chamot, 1995; Nosratinia & Zaker, 2014). Accordingly, in order to inspect the way CT and LLS are associated in this context, the following research question was posed:

Research question 2: Is there any relationship between critical thinking and language learning strategy use of Iranian EFL learners with focus on their proficiency levels?

To investigate this relationship, the results of Learners' CT scores were correlated with those of LLS, using Pearson's product-moment correlation coefficient. Results suggested that there is a significant and positive relationship between EFL learners' CT and overall use of LLS,  $r = .65$ ,  $n = 114$ ,  $p < .05$  for intermediate learners and  $r = .397$ ,  $n = 55$ ,  $p < .05$  for advanced learners.

#### ***4.4 The Relationship between creativity (CR) and language learning strategies (LLS)***

It seems to be a common belief held by many educators and psychologists that CR can significantly amplify higher order thinking and learning (Chamot, 1995; Kabilan, 2000; Sarsani, 2006). Based on this proposal, the following question was posed in order to systematically investigate the way CR and LLS are associated among EFL learners:  
Research Question 3: *Is there any relationship between creative thinking skills and language learning strategy use of Iranian EFL learners with focus on their proficiency levels?*

To answer this question, the data were analyzed by Pearson's product-moment correlation coefficient. The results showed that there was a significant and positive correlation between the two variables,  $r = .315$ ,  $n = 114$ ,  $p < .05$ , for intermediate learners while there was a significant and negative correlation between these two variables  $r = -.298$ ,  $n = 55$ ,  $p < .05$  for advanced learners.

The correlations between the variables of the model were tested in order to check if independent variables showed at least some relationship with dependent variable. It is shown in Table 4.2.

**Table 4.2****Correlation Analyses between dependent and independent variables**

	Proficiency	Creative Thinking	Critical Thinking	Language Learning Strategy	Sig
Intermediate Proficiency	–	.442	.518	.495	0.00
Creative Thinking		–	.310	.315	0.00
Critical Thinking			–	.658	0.00
Language Learning Strategy				–	

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

	Proficiency	Creative Thinking	Critical Thinking	Language Learning Strategy	Sig
High Proficiency	–	.027	-.048	.121	0.05
Creative Thinking		–	-.232	-.298*	0.05
Critical Thinking			–	.397**	0.05
Language Learning Strategy				–	

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

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

Correlation among proficiency level as dependent variable and three independent variables (creative thinking, critical thinking, and language learning strategy) were explored using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of linearity and homoscedasticity. There were medium positive correlations between proficiency and the three variables for intermediate learners: Proficiency and creative thinking skills,  $r = .442$ ,  $n = 114$ ,  $P < .05$ ; proficiency and critical thinking skills,  $r = .518$ ,  $n = 114$ ,  $P < .05$ ; and proficiency and language learning strategy,  $r = .495$ ,  $n = 114$ ,  $P < .05$ . For advanced learners the correlation between proficiency level and creative thinking was .27, between proficiency level and language learning strategies was .12, while there was no correlation between proficiency level and critical thinking,  $r = -.048$ .

#### 4.5 Proficiency as predicted by CT,CR LLS

Since the observed correlations between the four variables of Pro, CR, CT, and LLS turned out to be significant, it was legitimate to opt for the multiple regression analysis between the variables in order to answer the following research question:

Research Question 4: *Which components of critical thinking, creative thinking, and language learning strategy use predict the learners' overall proficiency levels? Which components are the best predictors?*

Results of Iranian EFL students' survey on creative thinking skills, critical thinking skills, and language leaning strategy use were first checked for normal distribution through test of normality. Results of Test of Normality revealed that P-value for both Kolmogorov-Smirnov and Shapiro-Wilk was higher than .05, so the assumption of normality was not violated, and the normality distribution of data was confirmed (Table 4.3).

**Table 4.3**

**Tests of Normality of Creative Thinking, Critical Thinking, and Language Learning strategy**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>Creative Thinking</b>	<b>.235</b>	<b>114</b>	<b>.200</b>	<b>.825</b>	<b>114</b>	<b>.687</b>
<b>Critical thinking</b>	<b>.322</b>	<b>114</b>	<b>.186</b>	<b>.740</b>	<b>114</b>	<b>.511</b>
<b>Language Learning Strategy use</b>	<b>.262</b>	<b>114</b>	<b>.231</b>	<b>.864</b>	<b>114</b>	<b>.710</b>

The analysis of descriptive survey data revealed that the Iranian EFL learners' overall average level of creative thinking skill was almost high (M=2.28, SD=.12 for intermediate learners; M=2.39, SD=.14 for advanced learners). Intermediate participants reported flexibility as the most frequent (M=2.35, SD=.17) component and originality (M=2.33, SD=.20), fluency (M=2.27, SD=.13) and elaboration (M=2.05, SD=.93) as the next components respectively, whereas advanced learners reported originality (M=2.43 SD=.19) as the most frequent component followed by fluency (M=2.41 SD=.11), flexibility (m=2.40 SD=.10), elaboration (m=2.38 SD=.09) in a decreasing order. Table 4.4 shows the related descriptive data.

**Table 4.4****Descriptive Statistics of Creative Thinking and its Components**

Intermediate		N	Mean	Standard Deviation
	Creative Thinking	114	2.28	.12
	Fluency	114	2.27	.13
	Elaboration	114	2.05	.93
	Originality	114	2.33	.20
	Flexibility	114	2.35	.17
Advanced	Creative Thinking	55	2.39	.14
	Fluency	55	2.41	.11
	Elaboration	55	2.38	.09
	Originality	55	2.43	.19
	Flexibility	55	2.40	.10

With respect to critical thinking skills, intermediate participants reported practically moderate level ( $M=3.46$ ,  $SD=.21$ ). Results also manifested that inference was somehow the most frequent skill ( $M=3.75$ ,  $SD=.41$ ) followed by analysis ( $M=3.60$ ,  $SD=.31$ ) and evaluation ( $M=3.34$ ,  $SD=.18$ ). In the same way, advanced participants almost did the same except for the most frequent component which belongs to evaluation ( $M=4.06$ ,  $SD=.37$ ) Table 4.5 shows the related descriptive data.

**Table 4.5****Descriptive Statistics of Critical Thinking and its Components**

Intermediate		N	Mean	Standard Deviation
	Critical Thinking	114	3.46	.21
	Inference	114	3.75	.41
	Evaluation	114	3.34	.18
Analysis	114	3.60	.31	
Advanced	Critical Thinking	55	3.82	.18
	Inference	55	3.79	.24
	Evaluation	55	4.06	.37
	Analysis	55	3.57	.14

Concerning the language learning strategy use, results of the survey data showed that Iranian language learners apply strategies somehow moderately ( $M=3.78$ ,  $SD=.46$  for the intermediate and  $M=4.06$ ,  $SD=.25$  for the advanced ). The analysis of the different components also showed that metacognitive strategies were the most frequent ( $M=3.93$ ,  $SD=.53$ ) followed by social ( $M=3.86$ ,  $SD=.97$ ), memory ( $M=3.84$ ,  $SD=.44$ ), compensation ( $M= 3.83$ ,  $SD=.51$ ), cognitive ( $M=3.76$ ,  $SD=.43$ ), and affective ( $M=3.40$ ,  $SD=.46$ ) strategies. Table 4.6 shows the related descriptive data.

**Table 4.6**

**Descriptive Statistics of Language Learning Strategy use and its Components**

		<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Intermediate</b>	<b>Language Learning Strategy</b>	<b>114</b>	<b>3.78</b>	<b>.46</b>
	<b>Memory</b>	<b>114</b>	<b>3.84</b>	<b>.44</b>
	<b>Cognitive</b>	<b>114</b>	<b>3.76</b>	<b>.43</b>
	<b>Compensation</b>	<b>114</b>	<b>3.83</b>	<b>.51</b>
	<b>Metacognitive</b>	<b>114</b>	<b>3.93</b>	<b>.53</b>
		<b>Affective</b>	<b>114</b>	<b>3.40</b>
	<b>Social</b>	<b>114</b>	<b>3.86</b>	<b>.97</b>
<b>Advanced</b>	<b>Language Learning Strategy</b>	<b>55</b>	<b>4.06</b>	<b>0.25</b>
	<b>Memory</b>	<b>55</b>	<b>4.10</b>	<b>0.12</b>
	<b>Cognitive</b>	<b>55</b>	<b>3.88</b>	<b>0.58</b>
	<b>Compensation</b>	<b>55</b>	<b>4.08</b>	<b>0.47</b>
	<b>Metacognitive</b>	<b>55</b>	<b>4.13</b>	<b>0.25</b>
	<b>Affective</b>	<b>55</b>	<b>3.85</b>	<b>0.41</b>
	<b>Social</b>	<b>55</b>	<b>4.42</b>	<b>0.27</b>

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Looking in the Model Summary box and checking the R Square value tells that the model (which includes the variables of Creative thinking, critical thinking, and language learning strategy) explains 38.2 percent of the variance in the dependent variable (proficiency) for intermediate learners and 20.2 percent of variance in the dependent variable for advanced ones. See Table 4.7.

**Table 4.7**

**Standard Multiple Regression analysis of Proficiency level, Creative Tanking, Critical Thinking, and Learning Strategy**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Intermediate	.618 <sup>a</sup>	.382	.365	5.438
advanced	.450 <sup>b</sup>	.202	.172	.22436

Table 4.8 shows how much each of the variables included in the model contributed to the prediction of the dependent variable.

**Table 4.8**

**Standard Multiple Regression of Creative Thinking, Critical Thinking, and Learning Strategy**

Intermediate	Model	Standardized Coefficients Beta	t	Sig.	Correlation Part
	Creative Thinking	.284	3.56	.001	.261
	Critical Thinking	.287	2.85	.005	.330
	Language Learning Strategy	.217	2.15	.033	.214
Advanced	Creative Thinking	.055	.379	.707	.053
	Critical Thinking	-.107	-.704	.485	-.098
	Language Learning Strategy	.179	1.160	.251	.160

Standard multiple regression analysis was used to measure the ability of three control measures (creative thinking, critical thinking, and language learning strategy) to predict levels of proficiency. Preliminary analyses were conducted to ensure no

violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. In the model, all three measures were statistically significant, with the critical thinking scale recording a higher beta value ( $\beta = .287, p < .001$ ) than the creative thinking scale ( $\beta = .284, p < .001$ ) and language learning strategy scale ( $\beta = .217, p < .001$ ).

Looking down the Beta column, it can be seen that critical thinking was the largest beta coefficient .287. This means that this variable makes the strongest unique contribution to explain the dependent variable, when the variance explained by all other variables in the model is controlled for. The Beta value for the other two variables, that is, creative thinking and language learning strategy, were slightly lower (.284 and .217 respectively), indicating that they made less of a contribution. Checking the Part correlation coefficients section of the table, it is also perceived that critical thinking explains 11 per cent of the variance in proficiency as the highest share, and creative thinking and language learning strategy each explains about seven and five percent of unique contribution in proficiency respectively.

## **5. Discussion**

The Cronbach's Alpha coefficient of Torrance Test of Creative Thinking (.74), Peter Honey's critical thinking (.75), and Strategy Inventory for language learning (.94) were above the established acceptable standard of .70 and indicated that the data collection instruments of the study were reliable. These findings were in line with the reported reliability results in the related studies by Abedi (1993) for TTCT and Hou (2012) for (PHCT) and Oxford (1990) for (SILL).

The descriptive statistics results of the Iranian EFL learners' creative thinking skill factor as reported in Table 4.4 manifested that the students' creative thinking skill status, in general, is relatively high and somehow being satisfactory (Mean=2.28). Among the four constructs of creative thinking skills, flexibility ranks the highest (Mean= 2.35), originality ranks the second (Mean=2.33), fluency stood as the third (M=2.27), and elaboration falls behind, merely above 2 (Mean=2.05). These findings are confirmed by Karnes et al., (1961), and McCabe's (1991) findings and suggest that students generally had an acceptable aptitude to generate a variety of ideas and were not very successful in the ability to develop, embellish, or fill out an idea.



Regarding the results of participants' critical thinking skills' survey reports, the average obtained mean score was (3.46) which seems to indicate that most of them ascribed relatively moderate importance to the majority of the critical thinking skills on the PHCT. Their reports also showed that out of three components of critical thinking, inference ranked as the most frequent ( $M=3.75$ ), analysis ranked second ( $M=3.60$ ), and evaluation ranked as the least frequent, slightly above 3 ( $M=3.34$ ). These findings were in line with findings of Hou (2012) and Nosratnia et al., (2014). Results suggest that although students have some awareness about critical thinking skills, their critical thinking base is, however, not very strong.

According to Oxford's (1990) classification of SILL's results, the average mean score of Iranian advanced EFL learners on language learning strategy use was relatively moderate ( $M=3.78$ ). As for the six types of learning strategies, learners reported metacognitive as the most frequent strategy ( $M=3.93$ ) followed by social ( $M=3.86$ ), memory ( $M=3.84$ ), compensation ( $M=3.83$ ), cognitive ( $M=3.76$ ), and affective ( $M=3.40$ ) respectively. Hence, the results are compatible with the previous research findings by Hou (2012) and Nosratnia et al., (2014) except that in their study, participants reported cognitive strategies as the most frequently used strategies. These findings show that, in general, students do not possess an acceptable awareness level of learning strategy use in the English.

The relationships between learners' language proficiency as dependent variable and creative thinking skills, critical thinking skills and learning strategy use as independent variables were tested. The analysis of the relationship through Pearson correlation coefficient showed a medium positive correlation between proficiency and three factors. Proficiency and creative thinking skills,  $r = .442$ , proficiency and critical thinking skills,  $r = .518$  and proficiency and language learning strategy,  $r = .495$ . Independent variables also manifested a medium positive inter-relationship as well. Creative thinking and critical thinking,  $r = .310$ , creative thinking and learning strategy,  $r = .315$ , and critical thinking and learning strategy,  $r = .658$ . These findings were also in line with the previous findings by Hou (2012) and Nosratnia et al., (2014) who conducted similar research and showed that learners' proficiency development is determined to a great extent by learners' creative, critical thinking skills and strategy application.

We tried to come up with a model in which the relationship among three independent variables (creative thinking skills, critical thinking skills and learning strategy use) with learners' proficiency were explored. Results of standard multiple regression test, as shown in Table 4.7, revealed that the model explains 38.2 percent of the variance in proficiency level. As illustrated by Table 4.8, critical thinking made the strongest unique contribution in the model explaining 11 per cent of the variance in proficiency as the highest portion, and creative thinking seven percent, and learning strategy five percent of unique contribution in proficiency respectively.

## **6. Conclusion**

By analyzing the Iranian EFL learners' data collected on creative thinking skills, critical thinking skills, and learning strategy use, this study came up with the following main findings: (1) Iranian EFL learners have almost a high level of creative thinking skills. (2) Among the four constructs of creative thinking, Iranian EFL learners scored flexibility, originality, fluency, and elaboration from most to least respectively. (3) The average mean score of Iranian EFL learners on critical thinking skills was relatively moderate. (4) Among the three constructs of critical thinking skills, learners reported inference as the most common followed by analysis, and evaluation skills respectively. (5) Participants' survey report showed an almost moderate level of language learning strategy use. (6) Among six strategy types, participants announced metacognitive as the most frequent used strategy followed by social, memory, compensation, cognitive and affective respectively. (7) There was a positive medium correlation between proficiency development as dependent variable and creative thinking skills, critical thinking skills, and learning strategy as independent variables. (8) There was a positive medium relationship among the independent variables. (9) The model which includes the variables of Creative thinking, critical thinking, and language learning strategy, predict 32.8 % of variance in students' proficiency development. (10) Critical thinking makes the strongest unique contribution to explain the dependent variable, followed by creative thinking and learning strategy respectively.

The findings of the present research suggested an urgent need to raise the learners' awareness on critical thinking skills as well as language learning strategy use to develop their English language proficiency. In addition, the insufficient critical thinking skills, as well as the limited learning strategy repertoire of the Iranian learners require

instructional focus on development of critical thinking skills, effective strategies use, provision of opportunities for their application in the language classroom, as well as encouragement of their use outside the instructional setting. Moreover, creative and critical thinking skills, and learning strategies are believed to have positive effects not only on English proficiency, but also on other skills such as writing, reading etc. Thus, creative and critical thinking skills and learning strategy instruction can also help to improve learners' overall language competences.

It is hoped that language teachers in Iran will take into account the findings of the current study in order to help their language learners become aware of creative and critical thinking skills, and the importance of effective learning strategy use for their language learning, progress and success. Furthermore, materials developers and skill designers are advised to provide sections and drills which focus on creative and critical thinking skills and learning strategy use independently. These exercises should encourage learners to use various effective skills and strategies. The limitations of the present research study suggest the direction for further research in future.

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