Prediction of English Language Proficiency Level Using Multiple Intelligences Theory and Critical Thinking Skills

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Abstract

The present study investigated the possible relationships between multiple intelligences, critical thinking and language proficiency level of Iranian English as Foreign Language (EFL) learners. The participants of the study included 117 intermediate young-adult EFL learners from ILI language institute in Tehran, Iran. The participants were invited to complete MIDAS and Critical thinking questionnaires. To assess the participants' English language proficiency, they were also asked to take a version of PET test. The results of the Pearson correlations showed that there was a meaningful relationship between multiple intelligences and critical thinking. A meaningful relationship was also found between the multiple intelligences and the English language proficiency level as well as the critical thinking and the English language proficiency level of Iranian EFL learners. In addition, the results of the multiple regression showed that both multiple intelligences and critical thinking could predict 45.2% of the English language proficiency level of EFL learners. Our findings also indicated that the multiple intelligences and the critical thinking had a significant contribution to predict the English language proficiency level of Iranian EFL learners.

Keywords: Critical thinking, EFL learners, Language proficiency, Multiple intelligences

INTRODUCTION

Gardner (1999) introduced the theory of multiple intelligences. He believed that human intelligence could not be measured through the test of Intelligence Quotient (IQ), which is based on logic and language. In his book titled '*Frames of Mind'*, Gardner introduced eight types of intelligences namely verbal-linguistic, logical-mathematical, visual-spatial, musical-rhythmic, bodily/kinesthetic, interpersonal, intrapersonal and naturalistic. According to Gardner (1983), Multiple Intelligences (MI) theory pluralize the traditional notion of intelligence. MI theory claims that each person has all of the eight intelligences combined in different ways to form the intelligence profile (Gardner,2006). Gardner (1993) also proposed that there was a need for

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educators to assess the intelligence profile of the individual learner accurately. According to Gardner, it was important to recognize the learners' strengths and weaknesses since it would help the learners to understand the areas where they had difficulty learning. Multiple intelligences (MI) theory also affected foreign language learning. For more than two decades, MI has transformed the way educators looked at teaching and learning a foreign and/or a second language (Smith, 2001). Christison (1998) asserted that MI theory offers teachers, in second language education, a way to examine the most effective teaching techniques and strategies in light of human differences.

According to Simpson (2012), the importance of critical thinking in education and language learning is widely acknowledged. He believed that students required help in a reflective way with a reasonable type of thinking, which would direct them to do things. According to Gardner and Jewler (1992), in spite of problem- solving and analytical abilities, successful students benefit from the critical thinking skills. The aim of critical language awareness in an educational context is "to achieve some critical distance on familiar practices [to better] understand the unfamiliar—to make the familiar strange and the strange familiar in ethnographic terms" (Van Lier & Corson, 1997, p. 245). The higher order thinking skills e.g. critical thinking should be an integral part of the second language (L2) curriculum to enhance language proficiency levels of EFL learners and students (Liaw, 2007). In line with the previous research studies on contributing the role of multiple intelligences and critical thinking in English language learning, this study investigated the relationship between multiple intelligences and critical thinking of Iranian English as Foreign Language (EFL) learners. This study also sought for any relationship between the mentioned variables (i.e. the multiple intelligences and the critical thinking) and the prediction of English Language proficiency level of participants.

Theory of Multiple Intelligence (MI)

Charles Spearman, in the 20th century, developed a model known as "*g model*" (Sternberg & Grigorenko, 2002). To propose the '*g*' factor (short for general factor), Spearman used the technique called factor analysis to summarize positive correlations among different cognitive tasks considering an individual's performance at one type of cognitive task tends to be comparable to that person's performance at other kinds of cognitive tasks. According to Williams, Zimmerman, Zumbo, and Ross (2003), the unitary general intelligence 'g' or general factor was considered as a firm representation of human intelligence and was given to human beings at birth. However, after World War II, psychometric investigations continued to revise and improve the measures of general intelligence operationally defined as the ability to answer questions on an IQ test monolithically restricted in logic and language (Gardner, 2006). Since IQ tests failed to account for other areas of cognitive abilities and individual differences, educators and psychologists began to believe that individuals could be hypothesized as having multiple abilities (Karolyi, Ramos-Ford, & Gardner, 2003); (Sternberg, 2005). Gardner's (1983) multiple intelligences (MI) theory was a useful alternative in that it could address individual needs. According to Armstrong (2009) the eight intelligences are as follows:

- *"Verbal/linguistic:* the capacity to use words effectively, whether orally, or in writing to manipulate the syntax , phonology ,semantics and the pragmatic dimensions or practical uses of language.
- *Logical/mathematical:* the capacity to use numbers effectively and to reason well as well as the sensitivity to logical patterns and relationships, statements, propositions, functions, and other related abstractions.
- *Visual/spatial:* the ability to perceive the visual-spatial world accurately and perform transformations upon those perceptions.
- *Musical:* the capacity to perceive, discriminate, transform, and express

musical forms as well as the sensitivity to the rhythm and pitch of melody.

• *Bodily Kinesthetic:* the ability to use one's whole body to express ideas and feelings and facility in using one's hands to produce and transform things.

• *Interpersonal:* the ability to perceive and make distinctions in the moods, intentions, motivations, and feelings of other people.

• *Intrapersonal:* the ability to act adaptively based on the knowledge by having an accurate picture of oneself; awareness of inner moods, intentions, motivations, and desires.

• *Naturalistic:* the ability to recognize and classify numerous species, the flora and fauna of an individual's environment" (p. 153).

Many schools in the United States (Gardner, 1993; Richards & Rodgers, 2014; Snider, 2001) such as 'The sky school', and Brazil (Botelho, 2003) adopted the multiple intelligences in their curriculum. In the United States, teachers of East Elementary school in Athens also received training in the field of multiple intelligences. According to Stefanakis, Stuart, Berg, and Guinee (2002), human development and general courses are taught in many education sectors using the multiple intelligence theory. He claimed that multiple intelligence is one of the most significant developments of education in half-past century. In Turkey, the integration of the theory of MI into the curriculum of the English Language Teaching (ELT) at the primary and the secondary level education is quite a recent phenomenon. In 2005, the ELT curriculum was revised to incorporate new methodological trends in ELT, and some current views were reflected in the formulation of objectives and the content of the curriculum.

Recently some researchers considered the application of the theory of multiple intelligence (MI) in realm of the English language learning (e.g. Akbari & Hosseini, 2008; Hajhashemi, Ghombavani, & Yazdi Amirkhiz, 2011;

Razmjoo, 2008; Richards & Rodgers, 2014; Yeganehfar, 2005). Therefore, the importance of MI in second language and foreign language learning has been already recognized (Buchen, 2006; Campbell, Campbell, & Dickinson, 2004; Chan, 2006; Christion, 2004). Multiple intelligences has been attended not only in public education but also in English teaching (Richards & Rodgers, 2014) as a new and effective method for presenting different teaching strategies and improving L2 learners' achievements (Lee & Oxford, 2008; Oxford, Cho, Leung, & Kim, 2004);(Lee & Oxford, 2008). According to Armstrong (2007), using multiple intelligences as an instructional plan can be a solution to the problems of language learning. In a study concerning the relationship between the use of intelligences in classroom and the self-efficacy in language skills, Shore (2002) found that there was a strong positive correlation between reading self-efficacy and logical-mathematical and interpersonal intelligences. Strong positive correlations were also revealed between writing self-efficacy and interpersonal, intrapersonal, bodily-kinesthetic and linguistic intelligences. In an experimental study of the effect of multiple intelligences on the cooperative learning, Chen (2005) found a meaningful difference between control and experimental group in terms of language proficiency. In another study about the relationship between intelligence profile and grammatical, writing and listening skills, significant correlations were found between bodily/kinesthetic, spatial, and intrapersonal intelligences and the L2 learners' grammar performance. Musical intelligence also showed a positive correlation with writing performance.

Among the Iranian scholars, Razmjoo (2008) investigated the effect of gender on multiple intelligence and he did not find a meaningful difference between these two variables. The results of his study showed that multiple intelligences could not predict language proficiency level and there was no statistically significant relationship between the multiple intelligences and the language proficiency level of Iranian EFL learners.

In another study conducted by Marefat (2007), the relationship between multiple intelligences and writing proficiency level of Iranian EFL learners was investigated. The findings of this study showed a meaningful relationship between kinesthetic, existential, and interpersonal intelligences with multiple intelligences. Similarly, Zarei and Mohseni (2012)and studied the relationship between multiple intelligences and grammatical and writing accuracy of Iranian EFL learners and found that intrapersonal and interpersonal intelligences were predictors of grammar accuracy and intrapersonal intelligence made a statistically significant contribution to predicting learners' writing accuracy. In other study Akbari and Hosseini (2008) found a positive meaningful relationship between the multiple intelligences and all types of language learning strategies.

Critical Thinking

The notion of Critical Thinking (CT) referred to 2500 years ago and was attributed to Socrates who put the common expectations and beliefs under question in a reflective way (Zireva & Letseka, 2013). Paul and Elder (2013) defined critical thinking as the art of thinking to make our thinking more clear, precise and defensible. Kettler (2014) considered critical thinking as "purposeful, self-regulatory [judgment, which] results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, [criteriological], or contextual considerations upon which judgment is based" (Facione, 1990, p. 3). More recently, Liaw (2007) defined critical thinking as an entity, which involves using of information, experience, and world knowledge and allow the EFL students to search for substitutes and changes, make inferences, raise questions, and solve problems.

Critical thinking and language learning

Independent thinking enables language learners to monitor and evaluate their own ways of learning more successfully. In other words, critical thinking makes the process of language learning more meaningful for learner (Rafi, 2011). Critical thinking is highly correlated with language proficiency level (Liaw, 2007). In addition, some studies have shown the contributing role of critical thinking in improving the writing skills and oral proficiency level of language learner (Chapple & Curtis, 2000) Learners would need to think creatively and critically to be proficient in a language (Chapple & Curtis, 2000). According to Brown (1999), in an ideal academic language program, the objectives of the curriculum should go beyond linguistic factors to develop critical thinking among learners. Teachers could help the learners to acquire the critical thinking abilities while learning a language (Lipman, 2003). (Kettler, 2014) compared the level of critical thinking of two groups of American elementary students and found that gifted students outperformed general education students but gender did not show any significant effect on critical thinking score of the students. Mehta and Al-Mahrooqi (2015) probed the effect of critical thinking on academic writing ability in a qualitative study showing positive meaningful effect of written practice on critical thinking abilities. In a study concerning the relationship among critical thinking, creativity, and autonomy, Mania Nosratinia and Zaker (2014) found that there was a meaningful relationship among critical thinking, autonomy, and creativity. Moreover, regression analysis showed that critical thinking had the most significant contribution in explaining autonomy.

Research Questions

Regarding the importance of multiple intelligences and critical thinking in foreign language learning, the present study examined the relationship between multiple intelligences and critical thinking of Iranian EFL learners. This study also investigated the prediction of English language proficiency level of the participants using the theory of multiple intelligences and critical thinking. Therefore, this study sought to tackle the following research questions:

1. Is there any meaningful relationship between MI and CT of Iranian EFL learners?

2. Is there any meaningful relationship between MI and language proficiency level of Iranian EFL learners?

3. Is there any meaningful relationship between CT and language proficiency level of Iranian EFL learners?

4. Can MI and CT predict language proficiency level of Iranian EFL learners?

METHODS
Participants & Instruments
Participants of this study included 117 female intermediate Iranian EFL learners (between 16 to 20 years old) studying English at Iran Language Institute (ILI) in Tehran, Iran.

Multiple intelligence developmental assessment scales (MIDAS)
To assess the types of multiple intelligences of Iranian EFL learners, Multiple Intelligence Developmental Assessment Scales (MIDAS) was distributed among learners. It is a self-report instrument, designed by "Shearer, C. B. (1994). The MIDAS: A professional manuals. United Status of America: Author. "). The instrument included 119 Likert-type (from 'a to f', with 'e' being the highest and 'f' being "I do not know"). The questionnaire takes 35 minutes to complete. The Persian-translated version of MIDAS was used in the present study, which was previously used by Akbari and Hosseini (2008) with Cronbach alpha reliability of 0.81. In this study, Cronbach alpha reliability was estimated 0.83

Critical thinking questionnaire
The second instrument of this study was the criti

cal thinking questionnaire (Honey, 2000), evaluating the principal skills of comprehension, analysis and evaluation. It involved 30 Likert-type closed-ended questions for measuring note-taking, summarizing, questioning, paraphrasing, researching, inferencing, discussing, classifying and outlining, comparing and contrasting, distinguishing, synthesizing, inductive and deductive reasoning abilities of learners. CT questionnaire was based on five-point Liker scale ranging from never (1 point), seldom (2 points), sometimes (3 points), often (4 points), to always (5 points). The final score of each participant was calculated from 30 to 150. In this study, the Persian version of the questionnaire was used. In a study conducted by M Nosratinia and Sarabchian (2013), Mania Nosratinia and Zaker (2014), Cronbach alpha reliability was this questionnaire was estimated 0.79 and 0.81 respectively. In this study, Cronbach alpha reliability was estimated 0.80.

Preliminary English test (PET)
An intermediate Preliminary English test (PET) was also used in this study. The reliability and validity of the test were checked by ESOL examination. In this study, Cronbach alpha reliability estimated 0.74.

RESULTS AND FINDINGS
Participants were invited to complete the two questionnaires (i.e. Multiple Intelligence Developmental Assessment Scales (MIDAS) and Critical thinking questionnaire). Then participants were asked to sit for the PET test.

To address the first research question, a Pearson correlation was run. The results showed that there was a meaningful relationship between multiple intelligence and critical thinking of Iranian EFL learners (r=.162, P>0.05) (see Table 1 below).

Table 1.

Pearson correlation between multiple intelligences and critical thinking

	MUTIPLE INTELLIGENC	CRTITICAL THINKING
	1	.162
MUTIPLEINTELLIGENCE		.017
	117	117

To address the first research question and to investigate any meaningful relationship between multiple intelligence and language proficiency, a Pearson correlation was run. The findings showed a strong meaningful relationship between multiple intelligences and language proficiency level of Iranian EFL learners (r=.614, P<0.05) (see Table 2 below).

Table 2.

Pearson correlation between multiple intelligences and language proficiency level

	MUTIPLE INTELLIGENCE	PROFICIENCY
MUTIPLEINTELLIGENCE	1	.614
		.000
	117	117

To address the third research question, a Pearson correlation was run to probe any meaningful relationship between critical thinking and language proficiency. As shown in the below Table 3, that there is a strong meaningful relationship between critical thinking and language proficiency level of Iranian EFL learners (R=.369, p<0.05)

Table 3.

Pearson correlation between critical thinking and language proficiency level

	PROFICIENCY	CRTITICALTHI KING
	1	.369
PROFICIENCY		.000
	117	117

To address the fourth research question, a multiple regression was employed to see if multiple intelligences and critical thinking could predict language proficiency level of EFL learners.

As shown in the below Table 4, R^2 turned to be .452. It means that 45.2% of the variance of dependent variable was explained by independent variables.

Table 4.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.672[a]	.452	.442	3.28262

a. Predictors: (Constant), MUTIPLE INTELLIGENCE, CRTITICAL THINKING

b. Dependent Variable: LANGUAGE PROFICIENCY

Table 5 reports the results of ANOVA, which is considered significant (F=46.957, P<000).

Table 5.
ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	1012.371	2	506.186	46.975	.000[b]
1	Residual	1228.415	114	10.776		
	Total	2240.786	116			

a. Dependent Variable: LANGUAGE PROFICIENCY
b. Predictors: (Constant), MUTIPLE INTELLIGENCES, CRTITICAL THINKING

Table 6 below shows the standardized Beta coefficients specifying the extent of the contribution of independent variables in predicting dependent variable. Since the associated significance levels of the two independent variables are less than 0.05, their contribution to the equation was statistically significant. However, multiple intelligences had the highest unique contribution in predicting language proficiency level since it has a higher Beta coefficient value than critical thinking (B=.569, t=8.100, P=0.000).

Table 6.
Beta Coefficients

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1.256	2.803		.448	.655
1	CRTITICAL THINKING	.093	.024	.277	3.937	.000
	MUTIPLEINTELLIGENE	.039	.005	.569	8.100	.000

a. Dependent Variable: LANGUAGE PROFICIENCY

DISCUSSION

In this study, the researchers investigated the possible relationships between multiple intelligences, critical thinking and language proficiency level of the EFL learners. The first research question investigated the relationship between multiple intelligences and critical thinking. The results of Pearson correlation showed a meaningful relationship. Therefore, it is concluded that there was a statistically significant relationship between multiple intelligences and critical thinking ability of Iranian intermediate EFL learners. The results of the present study are partly in agreement with the studies of Akbari and Hosseini (2008) Hajhashemi et al. (2011) who investigated the relationship between multiple intelligences and language learning strategies of Iranian EFL learners and found a positive meaningful relationship between them.

The second research question investigated the relationship between multiple intelligences and language proficiency level of EFL learners. The results of Pearson correlation showed a positive meaningful relationship. Therefore, there was a statistically significant relationship between multiple intelligences and the language proficiency level of Iranian intermediate EFL learners. This part of the study confirmed the results of Saricaoglu and Arikan (2009) who found a significant relationship between L2 learners' MI profiles and their performance on grammar and listening proficiency level of Iranian EFL learners. This finding is in line with Marefat (2007) and Yeganehfar (2005) who revealed a meaningful relationship between multiple intelligences and writing proficiency level of Iranian EFL learners. However, the study by Razmjoo (2008)

was disconfirmed not finding any significant relationship between multiple intelligences and language proficiency level of Iranian EFL learners.

The third research question examined the relationship between critical thinking and language proficiency. The results of Pearson correlation showed a positive meaningful relationship. Therefore, it was concluded that there was a statistically significant relationship between critical thinking and language proficiency level of Iranian EFL learners. This finding is in line with the studies by Kamali and Fahim (2011) who found a meaningful relationship between critical thinking and reading proficiency.

The fourth research question investigated whether multiple intelligences and critical thinking could predict language proficiency level of Iranian EFL learners. The results of multiple regression showed that both multiple intelligences and critical thinking were able to predict 45.2% of the variance of language proficiency. Therefore, it was concluded that multiple intelligences and critical thinking were predictors of language proficiency level of Iranian EFL learners. Multiple intelligence was the stronger statistically significant contributor of language proficiency level. The results are partly in agreement with the study conducted by Marefat (2007) who showed that kinesthetic, existential, and interpersonal intelligences made the biggest contribution to predicting the writing scores. However, this study disconfirmed Razmjoo (2008) who found that none of the intelligences could be predictors of language proficiency.

CONCLUSION

The present study has pedagogical implication for EFL teachers and learners. Using both critical thinking and multiple intelligences can facilitate and optimize teaching and learning a second language. To accomplish this aim, first, teachers and learners' awareness of critical thinking, multiple intelligences, and their application in language teaching and learning should be raised. MI and CT have been elaborated in language teaching

and learning. For example, American Society of Mechanical Engineers Professional Practice Curriculum (ASME PPC) has listed the components of critical thinking as perception, assumption, emotion, language, argument, fallacy, logic, and problem solving. Teachers when planning their lessons can incorporate some of these components such as problem solving and argument in language tasks.

Critical thinking can be used to teach different language skills. For example, Mehta and Al-Mahrooqi (2015) suggested seven factors to integrate critical thinking and writing skills:

- "Individual as well as group reflections on suggested topics.
- Small group interactions followed by whole group discussion of the text under consideration.
- Training in close reading of tasks involved in writing, especially the topic in question, to identify the focus, the connections required to be made and to understand any biases inherent in the question itself.
- Opportunity to draft an essay, which can be discussed, by peers as well as instructors in order to be able to fine tune the work based on ensuing discussions.
- A final writing from a preliminary draft, which has been reviewed, based upon feedback on content as well as form.
- Overall, the writing is on something with which the students are familiar or is, in some ways, relevant to their immediate context.
- Subsequent training in writing on areas, which are of interest that is more generic, could be given to students as they proceed in the academic semester" (p. 3).

Multiple intelligences can open a wider amalgam of opportunities for teachers and learners. Teachers should be aware of learners' diversities and interests and how to use multiple intelligences to meet their students'' learning styles and wants. First, teachers should evaluate learners' different types of intelligences through MI survey

questionnaires, checklists and interviews. Then they should incorporate different intelligences in language tasks and lesson plans to reflect students' different styles and intelligences. Different types of intelligences can be used in language teaching classrooms. Teachers can use verbal intelligence through vocabulary building exercises, finding alternative words activities, writing diary journals and other related activities to improve learners' vocabulary. They can get the students to create their own picture dictionary based on words from the stories they have read or heard. Pair work, group work and role-play can be also used in classroom tasks to tap interpersonal intelligence. Drawing, coloring, games, mime, and pantomime activities can be applied in classroom to favor those learners who are strong in bodily-kinesthetic intelligence. Using songs, music, poetry, rhymes and tongue twisters can be worthwhile alternatives to tap learners' musical intelligence and arouse their interest and attention.

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