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## An empirical examination of the association between multiple intelligences and language learning self-efficacy among TEFL university students

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### ABSTRACT

The current study investigated the association between multiple intelligences and language learning efficacy expectations among TEFL (Teaching English as a Foreign Language) university students. To fulfill the aim of the study, 108 junior and senior TEFL students were asked to complete the "Multiple Intelligence Developmental Assessment Scales" (MIDAS) (Shearer, 1996) and the "Learners' Sense of Efficacy Survey" (Gahungu, 2009). Descriptive statistics, correlation analysis and regression analysis were employed to analyze the data. The findings of correlation analysis indicated that, among the different types of intelligences, Linguistic and Intrapersonal intelligences had strong positive correlations with learners' self-efficacy beliefs. The results of regression analysis showed that Linguistic and Intrapersonal intelligences were positive predictors of learners' efficacy beliefs, whereas Mathematical intelligence was the negative predictor of students' self-efficacy beliefs. All in all, the findings of the present study contribute to the understanding of the interplay between students' multiple intelligences and their language learning self-efficacy beliefs; furthermore, they convey some implications for university teachers, material and curriculum developers and language testers.

**Keywords:** intrapersonal intelligence; linguistics intelligence; multiple intelligences; self-efficacy; TEFL students

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## Introduction

Human intelligence, according to Gardner, has multiple dimensions that should be acknowledged and developed in education. He argues that traditional intelligence or IQ tests such as the Stanford-Binet test measure language and logic; however, there are other equally important types of intelligence including interpersonal intelligence, intrapersonal intelligence, kinesthetic intelligence and so on (Richards & Rodgers, 2001). Gardner (1993) believes that intelligences are biopsychological potentials that we use to process information. They are activated in a cultural setting to solve problems or create products which are valuable in a particular culture. What activates a specific type of intelligence are the value system of a particular culture, available opportunities in that culture and the decisions that individuals, their families, school masters and others make.

Schools attempt to enhance the sense of accomplishment among students. The recognition of different abilities and talents in students is not a very far-fetched task by applying Gardner's theory of multiple intelligences (MI). His theory explains that not all students may be talented verbally or mathematically; however, they might be gifted in other dimensions such as spatial relations or music. If learning is approached and assessed in this way, more students will successfully take part in classroom learning (Brualdi, 1996).

Christinson and Kennedy (1999) believe that using MI theory in teachers' curriculum development brings about a better recognition of students' strengths. Teachers believe that MI enhances classroom practices as well as improves the discourse at school since via applying MI theory teachers concentrate more on a broader array of student abilities and strengths. It also helps teachers to comprehensively describe students to themselves, to their parents and to others; accordingly, a number of schools are modifying their report cards to reflect the enhanced views of their students (MacLeod, 2002). What it entails is that students get more involved in the process of learning since they use the types of learning that correspond to their intelligence strength (Christinson & Kennedy, 1999).

Besides the above-mentioned theoretical contentions, there are many conducted studies that advocate the decisive role of applying MI theory in effective teaching and learning in different educational areas and majors including language learning and teaching. For instance, Diaz and Heining-Boynnton (1995) used students' MI to teach them culture in second language classrooms. They found that judicious application of students' MI in a multicultural setting assisted them in learning more about their own culture and the target culture. Haley (2001) applied MI theory to construct teaching practices and instructional strategies. Final results divulged that teachers who applied MI strategies experienced a change in their career, approached more student-centered classrooms and were more vigorous and enthusiastic about their teaching and interacting with their students. Al-Balhan (2006), in a study on middle-school Kuwaiti children, assessed the effectiveness of learners' MI styles in predicting their improved reading skills via academic performance. He came to the conclusion that the participants of the experimental group for whom MI-based teaching was applied outperformed the control group who were taught traditionally. To recapitulate, what has emerged from these conducted studies and other similar research (e.g., Anderson, 1998; Palmberg, 2002; Saeidi, 2003; Wilen & Anders, 2005) is the fact that employing MI theory is of great help in providing creativity and productivity in instructional settings through which students' achievement and progress, to a great extent, is guaranteed. The experience of success, in turn, brings about other positive consequences for learners among which is the increase in self-efficacy beliefs in language learning and use since, according to social-cognitive theory, the most important source of efficacy beliefs is the experience of success (Caprara, Barbaranelli, Steca & Malone, 2006). Hence, it appears that there may be a positive relationship between MI and efficacy beliefs among EFL learners. According to the mentioned logical reasoning and the importance of both MI and self-efficacy beliefs in language learning (Rabbani, 2006; Wong, 2005),

this study was an attempt to investigate the association between the two variables directly and to shed more light on the relationship between the two constructs among EFL learners.

## Review of the Related Literature

### *MI theory*

Gardner adduced a theory of MI since he believed that the current psychometric tests examined the linguistic, logical and some aspects of spatial intelligences while there are other intellectual abilities such as musical talent, social awareness and athleticism which were ignored by those tests (Neisser et al., 1996).

Gardner's theory of MI claims that people possess at least eight different types of intelligences, to a greater or lesser extent which are as follows (Christison, 1998): 1) *Linguistic Intelligence*: It is the ability to use language effectively. Linguistically intelligent people are capable of making the best use of language, oral or written, in different settings. They are good at persuading other people to do something. 2) *Logical-Mathematical Intelligence*: Logically-mathematically intelligent people are good at reasoning and using numbers. Such people can categorize, classify, infer, generalize and calculate pretty well. 3) *Spatial Intelligence*: Those possessing this intelligence are sensitive to form, space, color, line and shape. These people are good at visualizing images. 4) *Bodily-Kinesthetic Intelligence*: People having bodily-kinesthetic intelligence generally use their body to express ideas and convey feelings. This kind of intelligence also has to do with physical skills such as balance, speed, flexibility, etc. Actors, athletes, mechanics, or surgeons, etc. have a high level of bodily-kinesthetic intelligence. 5) *Musical Intelligence*: Musically intelligent people are sensitive to rhythm, pitch and melody. They are capable of understanding music pretty well. 6) *Interpersonal Intelligence*: It is the ability to be in other peoples' shoes and understand their feelings and emotions. Interpersonally-intelligent people are skillful at responding to other people in pragmatic ways. 7) *Intrapersonal Intelligence*: Those possessing this type of intelligence have a good knowledge of themselves. They are cognizant of their own feelings, emotions, moods and desires. 8) *Naturalist intelligence*: People with naturalist intelligence are able to understand and organize patterns in nature (Christison, 1998).

Gardner believes that most people possess all types of intelligences; however, they are not the same regarding the extent to which they possess each type of intelligence. In addition, people usually combine and use the intelligences in highly personal ways (Campbell, 2000). In his theory, Gardner incorporates interactions among mental processes, contextual influences and multiple abilities. He believes that intelligence is dynamic and changes by the changes in the surrounding circumstances (Chongde & Tsingan, 2003). He argues that MI can be developed and strengthened, or neglected and weakened (Hosseini, 2003).

Gardner explains that there are different autonomous intelligence capacities which lead to different ways of knowing, understanding and learning about the world (Christison, 1998). According to his theory, all eight forms of intelligence are of the same significance; there is no important or unimportant intelligence. Consequently, it is possible to willingly rearrange the order of MI (Chongde & Tsingan, 2003). Gardner claimed that intelligences are relatively independent (Gardner, 1998) since strength in one type of intelligence does not predict strength or weakness in the other types.

There are both biological and cultural origins for MI. Neurobiological findings reveal that learning is the result of the modifications in the synaptic connections among cells. There are basic

components to each type of learning. These components are found in special sections of the brain where corresponding changes take place. Therefore, the different types of learning bring about synaptic connections in different areas of the brain. For instance, when the Broca's area is damaged, it leads to the loss in linguistic intelligence; in simpler terms, it is inability to use proper syntax while one is verbally communicating. However, this damage does not affect the patient's understanding of correct grammar and word usage. Gardner argues that culture, in addition to biology, has immense contribution in the development of the intelligences. Each community regards special types of intelligences as valuable and the hierarchy of value system is not the same in all societies. When a particular type of ability or skill is valued in one culture, this provides the incentive to become skilled in that area. What it entails is that special types of intelligences may be developed in the people of a particular culture while the same intelligences might not be as developed in the people of other cultures (Brualdi, 1996)

### *Self-efficacy*

According to Bandura (1977), self-efficacy is the personal judgments of one's capabilities to organize and implement courses of action to acquire specified objectives. Efficacy beliefs differ on several dimensions. They are different in *magnitude*; that is, when tasks are ordered according to their level of difficulty, the efficacy expectations of different people may be restricted to the simpler tasks, extend to moderately more difficult ones, or incorporate even the most demanding performances. *Generality* is the other dimension on which efficacy expectations differ. Some experiences bring about restricted mastery expectations while others lead to a more generalized sense of efficacy that extends beyond that particular context. Furthermore, efficacy expectancies are different in terms of *strength*. Weak expectations vanish by disconfirming experiences while strong expectations of mastery do not easily disappear despite disconfirming experiences (Bandura, 1977).

What determines how people behave is often the beliefs they have regarding their capabilities rather than what they are actually capable of doing, for these self-efficacy perceptions determine what people do with the knowledge and skills they possess. That's why the way people behave is sometimes disjointed from their actual capabilities and why their behaviors vary greatly even when they enjoy similar knowledge and capabilities. Many gifted individuals suffer from frequent (and sometimes debilitating) bouts of self-doubt regarding their capabilities just as many individuals enjoy over-confidence about what they are able to accomplish in spite of possessing a modest repertoire of skills. Beliefs and realities rarely perfectly match; consequently, accomplishments are better predicted by people's self-efficacy beliefs than by their previous accomplishments, knowledge or skills. Nonetheless, confidence or self-appreciation alone cannot lead to success when requisite skills and knowledge are missing (Pajares, 2002a).

With respect to educational contexts, educators have long believed that students' expectations about their academic capabilities have a decisive role in their achievements (Zimmerman, 2000). The difficulties students report in their basic academic skills are usually related to their beliefs that they are not able to read, write, handle numbers or think well – that they are not able to learn, even if these things are not objectively true. In other words, many students experience difficulty in school not because they are not able to perform successfully but because they are incapable of believing in their capabilities – they have learned to find themselves incapable of coping with academic work or to find out that the work is not relevant to their perceptual world (Pajares, 2002b). In contrast, those who feel self-efficacious about learning or performing a task participate eagerly, try harder,

persist in the face of difficulties and experience greater achievements (Schunk & Meece, 2005).

The information required to appraise self-efficacy is obtained from four primary sources: actual performance, vicarious experiences, forms of persuasion, and physiological reactions. The performances of the students are the most dependable guides for assessing their self-efficacy; In general, success raises and failure declines self-efficacy. However, an occasional failure after a series of successes is improbable to have much negative influence. Knowledge of others' performances through social comparisons is the other source of acquiring self-efficacy information. Similar others are the best source for comparison. When a student observes that his peers can learn a task, he begins to believe that he can also learn it. However, such vicarious information is generally less effective than actual performance due to the fact that vicariously-induced self-efficacy can be easily negated by subsequent failures. Verbal encouragement such as persuasive information from others (e.g., "You can do it") can raise self-efficacy, but its effect will be fleeting if the following performance is different. Self-efficacy information can also be obtained by physiological indicators such as heart rate or feelings of anxiety. These symptoms signal that the student lacks skills; on the other hand, when learners undergo fewer emotional symptoms they feel more self-efficacious (Schunk & Meece, 2005).

#### *Previous studies on the relationship between MI and self-efficacy*

Plenty of studies have been conducted on MI (e.g., Al-Balhan, 2006; Anderson, 1998; Haley, 2001; Palmberg, 2002) and on self-efficacy (e.g., Caprara et al., 2006; Coladarci, 1992; Moafian & Ghanizadeh, 2011; Wong, 2005); yet, research on the relationship between the two is quite meager. The few studies conducted on this area are as follows:

Beichner (2001) investigated the association between students' academic self-efficacy and teachers' MI instructional approach. She studied the differences in self-efficacy between groups of students whose teachers applied strategies that corresponded to the students' dominant intelligences and those whose teachers did not adapt their teaching styles to the students' intelligences. She found that students who were in classrooms in which the teachers applied two of their three dominant MI reported significantly higher self-efficacy than that of the other two groups. Chan (2003) studied the relationship between MI and perceived self-efficacy beliefs among 96 Chinese secondary school teachers in Hong Kong. The results divulged that interpersonal intelligence was the significant predictor of their self-efficacy in assisting others. The effect of MI self-assessment intervention on adolescents' career decision self-efficacy was studied by Reginald (2007). There were 71 middle school adolescents who were assigned into experimental and control groups. The experimental group received the MI-based intervention; however, no intervention was applied on the control group. Final results suggested no significant difference between the control and experimental groups on the posttest of Career Decision Self-Efficacy Scale. In a study on 23 teachers and teacher assistants during a 6-week period, Christi (2009) investigated the effect of using MI teacher training on the self-efficacy of teachers. It was found that applying MI teacher training had a statistically significant impact on teacher self-efficacy.

As far as exploring the relationship between MI and self-efficacy beliefs in language learning is concerned, to the researchers' best knowledge, the only conducted research is the one carried out by Shore (2001). Shore investigated the relationship between MI and self-efficacy among university students who were studying English at the intermediate and advanced levels. She found highly significant positive correlations between reading self-efficacy and mathematical-logical and interpersonal intelligences. Moreover, she reported positive correlations between writing self-efficacy and interpersonal, body-kinesthetic and linguistic intelligences. Speaking self-efficacy was

also found to be positively correlated with interpersonal and visual-spatial intelligences. The paucity of research into the possible association between EFL learners' MI and efficacy beliefs provides the necessary incentive for further investigations to explore such a relationship. Consequently, the current study, the same as Shore's (2001) research, was an attempt to examine the relationship between MI and efficacy expectations in language learning. However, it differs from shore's study with respect to the sample's educational background, the type of employed questionnaire and the numbers of considered skills. Shore conducted her study on university students from a variety of disciplines and educational backgrounds who were learning English at intermediate and advanced levels. In the current study, all participants were junior and senior TEFL students (i.e., they were majoring in "Teaching English as a Foreign Language"). Hence, the study was more narrowed down and the possible influence of major was controlled. To assess the learners' efficacy expectations, Shore employed Mikulecky's (1996) efficacy questionnaire which includes 25 items. In the present study, to evaluate the students' self-efficacy, "Learners' Self- Efficacy Survey", developed by Gahungu (2009), was utilized, which includes 40 items. It is natural that the more the number of the questions which are included in a questionnaire, the more reliable data and information can be elicited (Ritter, 1995). Concerning skills, Mikulecky (1996)'s questionnaire has only focused on three skills – speaking, writing and reading – but in Gahungu's questionnaire, all four language skills have been considered. Additionally, in Gahungu's scale, there are some questions regarding language components (i.e., grammar, vocabulary and pronunciation). In other words, "Learners' Self- Efficacy Survey" has paid attention to all language skills and components and assesses students' efficacy beliefs about them. Consequently, Gahungu's questionnaire is more comprehensive. Nevertheless, it is worth noting that Shore (2001) did her best in conducting her research; however, the reason why she did not use the more comprehensive questionnaire was the fact that Gahungu's questionnaire was developed some years later. Therefore, the current research complements Shore's study and paves the way for more constructive research in this realm. To fulfill the aim of the study, the following research question was raised:

- What is the relationship between Iranian TEFL university students' MI and their sense of self-efficacy beliefs?

## **Method**

### ***Participants***

The participants of the study consisted of 108 junior and senior students who were majoring in TEFL at Islamic Azad University. There were 86 females and 21 males; one participant did not specify his/her gender. Their age varied from 20 to 31 ( $M = 23.25$ ,  $SD = 2.29$ ); three participants did not specify their ages.

### ***Instruments***

#### *MIDAS questionnaire*

To measure the students' MI, Multiple Intelligence Developmental Assessment Scales (MIDAS) questionnaire was used. It consists of one hundred and nineteen questions about eight intelligences which are mentioned in Gardner's MI theory. In this questionnaire, the number of questions for each intelligence is as follows:

Table 1

*The Number of Questions of Each Intelligence*

	Musical	Kinesthetic	Mathematical	Spatial	Linguistic	Interpersonal	Intrapersonal	Naturalist
<b>The number of questions</b>	14	13	17	15	20	18	9	13

The results of factor analysis revealed that the questionnaire measured eight hypothetical constructs (Shearer, 1996; cited in Hosseini, 2003). Five studies examined the internal consistency of the items within each scale. The overall alpha coefficients for all subscales ranged from 0.78 to 0.89. Kinesthetic was the only scale where the reliability was slightly below the desired level of 0.80 (Shearer, 1996; cited in Hosseini, 2003).

In this study, to measure the learners' MI, the researchers employed the translated version of the questionnaire. The questionnaire was translated by Hosseini (2003) from English into Persian. In order to investigate whether the Persian MIDAS was able to distinguish eight distinct constructs as described by MI theory, she applied the Principle Axis Factoring analysis on the translated version. The results of factor analysis showed that the translated version was also able to distinguish the eight hypothetical constructs. Moreover, Hosseini (2003) examined the reliability of the Persian MIDAS through K-R21 formula. The results revealed that the reliability for all subscales varied from 0.63 to 0.92 with the minimum for interpersonal and the maximum for the intrapersonal intelligence subscales. In her study, the total reliability of the translated questionnaire was 0.81 which was a desired level of reliability.

In the current study, the total reliability of the questionnaire was 0.97 which was very high and satisfactory and the reliability of the questionnaire for each intelligence, calculated via Cronbach's Alpha, turned out to be as follows:

Table 2

*The Reliability of Each Intelligence*

	Musical	Kinesthetic	Mathematical	Spatial	Linguistic	Interpersonal	Intrapersonal	Naturalist
<b>Alpha</b>	.85	.72	.75	.86	.92	.89	.84	.86

*Learners' self-Efficacy survey*

To assess the EFL learners' self-efficacy, "Learners' Self-Efficacy Survey" was employed. This questionnaire was designed and standardized by Gahungu (2009). As Gahungu stated, the

questionnaire operationalizes the self-efficacy construct via scores obtained on 40 items ranging from never to always. To estimate the reliability of the “Self-Efficacy Survey”, the Kurder-Richardson 21 reliability was computed and the result was .97. In this study, the total reliability of the questionnaire, calculated via Cronbach' alpha, was found to be 0.96 which was high and satisfactory.

### ***Data collection***

To conduct the study, the participating TEFL university students were asked to fill out the MIDAS questionnaire and the "Learners' Sense of Efficacy Survey". About 23 students completed the questionnaires in the class and delivered them to the researchers and the rest took the questionnaires home, filled them in and returned them to the researchers in the following sessions. Out of almost 280 distributed questionnaires (140 efficacy questionnaires & 140 MIDAS questionnaires) which were distributed, 216 (108 efficacy questionnaires & 108 MIDAS questionnaires) were returned. Concerning ethical procedures, passive consent – involving “not opting out or not objecting to the study” (Dörnyei, 2007, p. 70) – was considered. To ensure the reliability of the data, the purpose of completing the questionnaires was explained to the participants and it was guaranteed that their data would be confidential. The participants' questionnaires were coded numerically and the confidentiality and anonymity considerations were observed.

### ***Data analysis***

To analyze the data, in the first step, descriptive statistics were employed. To determine the relationship between students' MI and efficacy, a Pearson Product-Moment correlation was run. To find out which types of intelligences might have more predictive power in predicting the learners' efficacy, a step-wise regression analysis was conducted.

## **Results**

In order to analyze the relevant data in this experiment, the Statistical Package for Social Sciences (SPSS), version 18, was employed. The level of significance was set at 0.05. Table 3 summarizes the descriptive statistics of the two instruments - MIDAS and Self-Efficacy Questionnaires - utilized in this study.

*Table 3*

*Descriptive Statistics of MIDAS and Self-efficacy*

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Self-Efficacy</b>	108	34.00	151.00	95.5463	24.82213
<b>Music</b>	108	7.00	93.00	40.7315	16.06389
<b>Kinesthetic</b>	108	16.00	89.00	45.0185	16.68901
<b>Math</b>	108	15.00	83.00	46.7222	13.01748
<b>Spatial</b>	108	11.00	92.00	46.5093	16.52667
<b>Linguistic</b>	108	13.00	93.00	54.3889	19.72751
<b>Interpersonal</b>	108	9.00	95.00	57.3148	19.99329
<b>Intrapersonal</b>	108	15.00	93.00	51.6667	15.61272
<b>Naturalist</b>	108	2.00	89.00	41.3981	17.38188



To investigate the correlation between the students' self-efficacy and MI, a Pearson Product-Moment correlation was applied. The results indicated a strong positive correlation between the students' self-efficacy and linguistic ( $r = 0.557$ ,  $p < .05$ ) and intrapersonal ( $r = 0.544$ ,  $p < .05$ ) intelligences and also a moderate positive relationship between the students' self-efficacy and their mathematical ( $r = 0.213$ ,  $p < .05$ ), spatial ( $r = 0.332$ ,  $p < .05$ ) and interpersonal ( $r = 0.479$ ,  $p < .05$ ) intelligences (see Table 4).

Table 4

*The Results of Correlation between Teachers' Self-efficacy and MI*

Sig.		Self-efficacy
.024	<b>Music</b>	.217
.062	<b>Kinesthetic</b>	.180
.027	<b>Math</b>	.213*
.000	<b>Spatial</b>	.332*
.000	<b>Linguistic</b>	.557*
.000	<b>Interpersonal</b>	.479*
.000	<b>Intrapersonal</b>	.544*
.737	<b>Naturalist</b>	.033

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

To investigate which intelligences of MI might have more predictive power in predicting the students' self-efficacy and how other intelligences contribute to the model, a stepwise regression analysis was run. The following table is the ANOVA table of regression. The quantities of F-values and the magnitudes of the respective p-values ( $p < 0.05$ ) indicated that the considered models were significant (see Table 5).

Table 5

*The ANOVA Table of Regression*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20485.542	1	20485.542	47.786	.000 <sup>a</sup>
	Residual	45441.227	106	428.691		
	Total	65926.769	107			
2	Regression	22125.976	2	11062.988	26.520	.000 <sup>b</sup>
	Residual	43800.792	105	417.150		
	Total	65926.769	107			
3	Regression	24139.463	3	8046.488	20.026	.000 <sup>c</sup>
	Residual	41787.305	104	401.801		
	Total	65926.769	107			

a. Predictors: (Constant), Linguistic

b. Predictors: (Constant), Linguistic, Intrapersonal

c. Predictors: (Constant), Linguistic, Intrapersonal, Math

d. Dependent Variable: Efficacy

As Table 6 displays, among the different intelligences of MI, only three (i.e., linguistic, intrapersonal and mathematical) were found to be good predictors of the dependent variable (self-efficacy). Among the three, linguistic and intrapersonal intelligences were the positive predictors, whereas mathematical intelligence was the negative predictor of the students' self-efficacy beliefs.

Table 6

*The Results of Regression Analysis for Teachers' MI and Self-Efficacy*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	57.398	5.867		9.783	.000
	linguistic	.701	.101	.557	6.913	.000
2	(Constant)	50.215	6.828		7.355	.000
	Linguistic	.426	.171	.339	2.488	.014
	Intrapersonal	.429	.216	.270	1.983	.050
3	(Constant)	58.578	7.672		7.635	.000
	Linguistic	.306	.176	.243	1.733	.086
	Intrapersonal	.832	.278	.523	2.989	.003
	Math	-.485	.217	-.254	-2.239	.027

a. Dependent Variable: Self-Efficacy

Table 7 illustrates the model summary statistics. The results revealed that the model containing the three intelligences of linguistic, intrapersonal and mathematical could predict 34 percent of the students' self-efficacy. The R value was 0.605 which indicated the correlation coefficient between the students' self-efficacy and the three intelligences. Additionally, it showed the effect size of the analysis which was a large magnitude (Larson-Hall, 2010). Its square value was 0.366 and its adjusted square was 0.348. It showed that about 34% of the variation in the students' self-efficacy could be explained by taking their linguistic, intrapersonal and mathematical intelligences into account. Based on the quantity of the adjusted R square (Larson-Hall, 2010), it can be inferred that

the three intelligences of linguistic, intrapersonal and mathematical could justify the variance of the students' efficacy expectations to a large extent (see Table 7).

Table 7

*R Square Table for Linguistic, Intrapersonal and Math Intelligences as the Predictors of Teachers' Self-Efficacy*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557a	.311	.304	20.70485
2	.579b	.336	.323	20.42426
3	.605c	.366	.348	20.04497

a. Predictors: (Constant), linguistic

b. Predictors: (Constant), linguistic, intrapersonal

c. Predictors: (Constant), linguistic, intrapersonal, math

## Discussion

The current study sought to explore the association between MI and self-efficacy beliefs among TEFL students. The results suggested that there were strong positive associations between the students' efficacy expectations and their linguistic and intrapersonal intelligences. It was also found that linguistic and intrapersonal intelligences were the positive predictors, whereas mathematical intelligence was the negative predictor of the students' self-efficacy beliefs.

Regarding linguistic intelligence, the finding of the study is compatible with Shore's (2001) study in which he found a strong positive correlation between EFL learners' linguistic intelligence and their writing self-efficacy. Linguistic intelligence, as the term implies, refers to the capability to make use of words successfully, whether orally or in writing. It incorporates "the ability to manipulate the syntax or structure of language, the phonology of sounds of language, the semantics or meanings of language, and the pragmatic dimensions or practical uses of language" (Armstrong, 2009, p. 6). Rhetoric, mnemonics, explanation, and metalanguage are examples of such uses of language (Armstrong, 2009). Consequently, it was expected that linguistic intelligence would be found as a positive predictor of language learning efficacy. Mahdavy (2008) argues that linguistic intelligence is required at all stages of processing from sound perception to syntactic parsing and semantic analysis. Accordingly, it appears that the experience of success (mastery experience) is the major source that nurtures the efficacy beliefs of learners with high levels of linguistic intelligence. TEFL students with higher levels of linguistic intelligence seem to be able to express themselves more confidently and to perform far better than those with lower levels of linguistic intelligence since this type of intelligence is directly connected with their field of study. In other words, it is more probable that highly linguistically intelligent students excel their classmates in both oral and written uses of language. This fact per se leads to their superior performance and higher scores; consequently, what it entails is their higher efficacy beliefs because, as Schunk and Meece (2005) argued, the prime source of enhancing efficacy beliefs is the experience of success. The existing empirical research also substantiates this claim. The previous studies indicated that there was a positive relationship between learners' linguistic intelligence and their vocabulary knowledge (Skourdi & Rahimi, 2010), successful writing (Marvi, 2008; Yeganehfar, 2005), speaking (Marvi, 2008) and listening (Marvi, 2008; Mahdavy, 2008) skills.

The second positive predictor of students' efficacy expectations was found to be intrapersonal intelligence. Intrapersonal intelligence is defined as self-knowledge and the capacity to perform

adaptively based on that knowledge. It involves the capacity for self-discipline, self-understanding and self-esteem and also having an accurate image of one's potencies and weaknesses, as well as understanding of internal moods, wishes, temperaments, aims, and incentives (Armstrong, 2009). Self-efficacy is subjective evaluations of one's abilities to systematize and carry out courses of action to achieve specified objectives. When the two definitions are compared, it is divulged that the essence of the two constructs is almost similar; both derive from individuals' cognition toward themselves, that is, a kind of knowledge and understanding that people possess concerning their capabilities and shortcomings.

Moreover, intrapersonal intelligence can contribute to effective second language learning from affective dimension. According to humanistic psychology, learning includes both the physical and affective aspects of an individual, as well as the cognitive (Arnold & Fonseca, 2004). Similarly, there is a strong neurobiological proof for the crucial role of affect in learning. Schumann (1994, p. 232; cited in Arnold & Fonseca, 2004) argues that "brain stem, limbic and frontolimbic areas, which comprise the stimulus appraisal system, emotionally modulate cognition such that, in brain, emotion and cognition are distinguishable but inseparable. Therefore, from a neural perspective, affect is an integral part of cognition". A great many affective variables, including self-esteem, inhibition and anxiety, which play an important role in second language mastery, are dimensions of intrapersonal intelligence. A fully fledged intrapersonal intelligence empowers one to understand individual potencies and limitations, and to distinguish how they are challenged by second language learning (Smith, 2001).

Intrapersonally intelligent TEFL students are well aware of their capabilities and loopholes and can manage their emotions quite well. They know how to cope with their emotions such as fear, anxiety, feelings of alienation, developing a second identity and acculturation which are common problems for language learners since, as Armstrong (2009) mentioned, intrapersonal intelligence is self-knowledge and the capacity to take action adaptively according to that knowledge. Consequently, these learners appear to have a much better performance compared to their counterparts who are not intrapersonally as intelligent. Pervious empirical studies also corroborate this issue. It has been found that intrapersonally intelligent learners are more successful in writing (Marvi, 2008), speaking, reading and listening (Yeganehfar, 2005) skills. This superior performance contributes to their higher scores and this, in turn, brings about higher self-efficacy beliefs.

Regarding mathematical intelligence, it is noteworthy that language learning is a constant problem solving process. Learners continually encounter novel inputs and information which they ought to comprehend, digest and anchor to their existing schema in a way that they have optimal learning and recall. In so doing, making analogies, reasoning, finding patterns and connections in diverse concepts and inferencing are sine quo non aspects of learning, and these factors are all subsumed under mathematical-logical intelligence. Students possessing high mathematical-logical intelligence enjoy the power of discovering logical associations among ideas in the classroom; finding such a relationship assists them in remembering how to learn. It backs the idea that this intelligence can result in higher self-efficacy (Shore, 2001). Quite contrary to the expectation, it was found that mathematical-logical intelligence was the negative predictor of students' efficacy expectations in language learning. Contemplating the possible justifications for coming up with such a finding, the researcher adduced the following factors: In the context where the study was carried out, the majority of students majoring in foreign language courses are the ones whose discipline at high school has been humanities. In fact, these students are those for whom mathematics has been the Achilles' heel and who are not that good at mathematical-logical intelligence. Hence, augmenting students' sense of competence through their weak areas does not seem logical; when situation challenges their weakness (i.e., their mathematical intelligence), this might backfire on their judgments of their capabilities, subsequently, declining their efficacy beliefs. Moreover, delving beneath the content of efficacy questionnaire administered in the present study, the researcher speculated that the second reason as to why mathematical intelligence is the negative predictor can

be due to the fact that, in the “Learners’ Self- Efficacy Survey”, there are not as many items related to mathematical intelligence as there are related to linguistic and intrapersonal intelligences and even the items connected with mathematical intelligence are not directly associated with it. This can also plausibly justify this finding of the study.

## Conclusion

As the findings of the study revealed, linguistic and intrapersonal intelligences were positively related to the TEFL students’ self-efficacy beliefs whereas mathematical intelligence turned out to be the negative predictor of the students’ efficacy expectations. Based on the decisive role that efficacy beliefs play in students’ achievement and creating a dynamic and constructive learning environment (Pajares, 2002b; Schunk & Meece, 2005; Wong, 2005; Zimmerman, 2000), augmenting linguistic and intrapersonal intelligences as the positive predictors of TEFL students’ efficacy expectations can be of great help in boosting students’ self-efficacy beliefs. Accordingly, the findings of the study convey some implications for university teachers, material and curriculum developers and language testers.

TEFL university teachers are advised to help their students get a direct and clear picture of their capabilities and talents since, via gaining a better knowledge of themselves, students are able to develop their intrapersonal intelligence; this, in turn, enables them to better evaluate themselves and their own capabilities, and connect and cope with their environment more efficiently. In so doing, exploiting activities such as independent student work, personal journal keeping, reflective learning (Saricaoglu & Arikan, 2009) and reaction paper writing (Green, 1999; cited in Shore, 2001) can be useful to a great extent. Enhancing students’ linguistic intelligence should be the other concern of TEFL university teachers. To this end, they can use activities such as brainstorming, debating, journal keeping, discussing, giving lectures, reading to the class, storytelling and writing activities (Armstrong, 2009).

The implications of the present study for TEFL curriculum developers are numerous. They are recommended to design the university curriculum in a way that aids TEFL students develop higher levels of linguistic and intrapersonal intelligences gradually. This might look difficult to achieve at first look; however, by long-term planning it is possible because, according to MI theory, peoples’ intelligences are not resistant to change, and practice in a particular domain can increase a particular type of intelligence. Therefore, methodical and long-term planning on the educators and curriculum developers’ part can be of invaluable help in aiding TEFL students develop their linguistic and intrapersonal intelligences. This will entail the call for the assistance of psychologists and experts in psychology in designing the TEFL curriculum since it is not only the content that matters any longer but what seems necessary besides content matter is the type of the exercises and activities that are created in order to help learners grow higher levels of linguistic and intrapersonal intelligences.

While preparing instructional materials for TEFL students, material developers are recommended to include language learning tasks such as “self-talk or reading activities where students develop their attitudes towards a problem” (Robles, 2002; cited in Arnold & Fonseca, 2004, p. 129), individualized projects (Saricaoglu & Arikan, 2009), word games, and writing exercises (Armstrong, 2009) in textbooks and instructional materials in order to develop intrapersonal and linguistic intelligences.

Finally, the implication for language testers is a serious one. The strong relationship between linguistic and intrapersonal intelligences and self-efficacy beliefs is a harbinger of a peril in language

testing. Sometimes, two TEFL students with the same level of knowledge at a particular area perform differently and consequently get different scores. According to the results of the current study, TEFL students with higher levels of linguistic and intrapersonal intelligences were the ones who were more efficacious in language learning. As Pajares (2002a) argued, self-efficacy perceptions determine what people do with their knowledge and skills and that is why people's behaviors vary greatly even when they possess similar knowledge and abilities. Therefore, the difference between the performances of two TEFL students with the same level of knowledge may be due to their differences in linguistic and intrapersonal intelligences and, ultimately, their efficacy expectations. Hence, language testers are advised to interpret students' scores with enough caution since the TEFL students who perform less successfully may not be necessarily less knowledgeable than the better performing students.

Nevertheless, the current study suffered from some limitations. The present study was presumably the first attempt to investigate the association between TEFL university students' MI and self-efficacy. Moreover, it was not feasible to give a proficiency test to the students and determine their exact level of proficiency; only the students' academic year was considered. Therefore, it is recommended that the study be replicated considering students' proficiency level besides their major and grade at university. Additionally, due to lack of an instrument measuring the achievement in any MI directly and practically, the present researchers employed MIDAS which is a self-report and paper-and-pencil assessment which relies heavily on participants' honesty and this is a drawback of the current research. Although the negative impact of the subjects' dishonesty and subjectivity was controlled by the facts that (a) the researchers explained the purpose of completing the questionnaires and (b) their questionnaires were coded numerically and they were asked not to write a name on their questionnaires; in case of the existence of a tool assessing MI directly and practically, it is recommended that the study be replicated. Finally, since this study was conducted on university students, a similar study is recommended to be carried out on students at school and language institute contexts to examine whether the context and level of education can influence the association between MI and self-efficacy among students.

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