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An investigation into the relationship between EFL teachers' and students' multiple intelligences and teaching styles

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Abstract
The present study investigates the relationship between multiple intelligences and teaching styles of English as Foreign Language (EFL) learners and teachers. The participants of the study included 106 EFL teachers and 400 EFL learners. Teachers were invited to complete a Multiple Intelligences Inventory for EFL Teachers, developed by Christison (1998) and a Thinking Styles Inventory in Teaching, developed by Grigorenko and Sternberg (1993). The students were also asked to complete Student-Generated Inventory for Secondary Level and Young Adult Learners, which was developed by Christison (1996; 1998). The results of the descriptive statistics showed that EFL teachers and students preferred the interaction of different kinds of multiple intelligences and teaching styles in the classroom. Pearson correlation, three-way ANOVA and Multivariate ANOVA further illustrated that there was a significant relationship between EFL teachers' multiple intelligences and the styles of teaching. Factors such as age, field of study and gender, however, did not have any significant effect on multiple intelligences and teaching styles of EFL teachers.

Keywords: The theory of multiple intelligences, teaching styles, cognitive psychology, English as foreign language (EFL) teachers and learners, cognitive development.

INTRODUCTION

According to Slavin (2003), the study of individual and group behavioural differences in education psychology is a worthwhile topic to investigate. Categories of individual traits in learning and teaching consist of intelligences and styles. In this article, individual differences concerning the intelligences refers to the ability of doing something, whereas styles refer to individual preferences and the effectiveness in the use of one's abilities (Messick, 1996). Individual learners may differ in their ability to understand concepts and reasoning to adapt effectively to their environment and learning experiences.

The theory of multiple intelligences can be applied in some settings, such as education, career advancement, counselling and personal development (Mantzaris, 1999). Gardner (1983; 1993; 2000) interprets intelligences as ways to solve problems, which also denote individual

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differences. While all people possess the many intelligences (including, musical–rhythmic, visual–spatial, verbal–linguistic, logical–mathematical, bodily–kinesthetic, interpersonal, intrapersonal, and naturalistic), each person has their own particular mix of intelligences (Gardner, 1983). In education this means that individuals with different intelligences may possess different learning styles, however, it is important to provide instructional materials and activities that match their intelligence types to support their learning (Gardner, 2000). Christison (1998) and Armstrong (1994) suggest that teachers need to use different approaches in teaching to cater for various types of intelligences, because learners can develop their intelligences according to the knowledge gained. Gardner's theory of the multiple intelligences and Sternberg's theory of mental self-government (1998), consider individual differences and encourage learners to adapt to their environment by effectively incorporating their skills whilst undertaking different activities.

The application of students' most effective intelligences, in Sternberg's view (2002), is defined as their ability to adapt their environments to improve learning. Initially, Sternberg proposed 13 thinking styles in his theory, which recently have been categorised into three types, including type I, type II and type III. When these thinking styles are applied to pedagogical contexts, they are known as teaching styles (Kabadayi, 2007). Different styles of teaching, therefore, may have a different impact on individual learners**.** The application of different intelligences and teaching styles by EFL teachers, respectively, may be affected by their own preferences for different intelligences and their own teaching styles. The present study, therefore, investigates the differences between EFL teachers and students' multiple intelligences.

Review of Literature

The Multiple Intelligences Theory

The theory of multiple intelligences (MI) was introduced by Gardner (1983). It is based on different intellectual capacities, which revolutionised traditional understandings of intelligences, its application including resources and teaching techniques. This theory proclaims that people: (1) have many intelligences; (2) can develop intelligences to competent levels; (3) incorporate various intelligences to perform different tasks; and (4) can express intelligence through a variety of ways (Mindy, 2005; Osmon & Jackson, 2002).

Contrary to the traditional notion of people having a pre-set intelligence, according to Gardner's theory, humans possess various intelligences and, over time improvements can occur. He initially proposed that they were seven main intelligences including verbal/ linguistic, logical/ mathematical, musical, body/kinaesthetic, spatial, interpersonal and intrapersonal intelligences. Gardner has since added three other intelligences to those aforementioned, including naturalistic, spiritual and existential intelligences. Gardner's (2000) definitions of these intelligences are noted below:

- Verbal/linguistic intelligence concerns the mastery of verbal and written language skills.
- Logical/mathematical intelligence is about effective reasoning and the ability to notice numerical and/or logical patterns.
- Musical/rhythmic Intelligence involves the ability to recognise non-verbal sounds in the environment and a sensitivity to pitch, melody, tone and rhythm.
- Visual/spatial Intelligence relates to the ability to manipulate and create mental images, as well as remembering facts by visualizing and recognising the form, space, color, line, and shape.
- Bodily/kinesthetic intelligence is the ability to use one's body to express ideas and feelings to communicate.
- Interpersonal intelligence involves the disposition to effectively communicate and interact with others.
- Intrapersonal intelligence has to do with self-reflective capabilities in the identification of one's strengths and weaknesses concerning their reactions and emotions.
- Naturalistic intelligence refers to the ability to nurture and relate to the natural environment in

a holistic and sensitive manner.

Gardner (2000) defines intelligences as the "bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (pp. 33–34). He includes the following features to help form a definition of an intelligence, which are embedded in the disciplines of biological sciences, logical analysis, developmental psychology and traditional psychological research:

> Intelligence roots in the brain and its potential isolation by brain damage. Intelligence roots in an evolutionary history and evolutionary plausibility. Intelligence is an identifiable core operation or set of operations. Intelligence is a definable set of 'end-state' performances. Intelligence has the susceptibility to encode in a symbol system. Intelligence is exemplified through existence of idiots, savants, prodigies and other exceptional individuals. Intelligence is supported from experimental psychological tasks. Intelligence is supported from psychometric findings (Gardner, 1983, pp. 62-69).

Abdulaziz (2008) and Ulinwa (2008) report that the multiple intelligences theory, however, was not specifically designed for education and English language teaching (ELT); although the theory was later considered by educationalists, material developers, lesson planners and teachers. They also claimed that both teachers and learners can benefit from the multiple intelligences theory. Abdulaziz and Ulinwa further suggest that this theory can help teachers to apply different pedagogies and forms of assessment, in their classrooms, with students to ascertain their learning progress through different ways of knowing and understanding. Considering idiosyncratic differences among learners, the important principle relating to how people learn best through their intelligences, involves the consideration of applicable pedagogical approaches (Gardner, 1983; Hoerr, 2000). Christison (1996) recommends three steps in teaching through the multiple intelligences: the ability of teachers and learners to recognise and understand their preferred intelligences (comprehension); the ability for teachers to incorporate the multiple intelligences to guide students with their learning (application); and the importance of teachers supporting students to recognise and apply their preferred intelligences (stimulation). Kulinna and Cothran (2003) assert that the theory of multiple intelligences is a prominent aspect for teachers' in mastering different teaching styles. Armstrong (2000) suggests that multiple intelligences can help teachers to reflect on their pedagogical approaches and employ different strategies and methods to improve their teaching.

Multiple Intelligences and Teaching Pedagogies

A paradigm shift in English Language Teaching (ELT) in the past several decades has been a change from a teacher-centered to learner-centered approach (Sinder, 2001). According to Sinder there has been a change of trajectory from incorporating a singular teaching method such as the Audio-lingual Method, the Total Physical Response [the coordination of language and students' responses with whole body actions (Richards, 2001)], Cooperative Learning [working in small groups to complete tasks collectively (Larsen-Freeman, 2000)], Suggestopedia [the inclusion of personal participation through games, songs, classical arts, and pleasure (Richards, 2001)], and Communicative Language Teaching [communication based on meaningful interactions (Richards, 2001)] , to a more eclectic approach. Sinder (2001) purports that ELT teachers, in the past, also applied multiple modal intelligences, but were unaware of the contemporary theory of multiple intelligences. Practicing listening comprehension in the past, however, also incorporated verbal/linguistic modes of teaching through rote repetition using the Audio-lingual Method of teaching English. Another example was the use of the Total Physical Response, which emphasised both bodily/kinesthetic and verbal modes. Similarly, the Silent Way

method [an extensive use of verbal silence as a teaching technique (Richards, 2001)] of language teaching encompasses a combination of intelligences. In this way, teachers may incorporate the use of visual/spatial and bodily kinesthetic intelligence by including physical objects, making gestures and performing pantomimes. With Suggestopedia, for example, students' musical intelligence maybe developed through activities that embrace soft baroque music (Richards, 2001) and their visual/spatial intelligence improved through creating relaxing environmental aesthetics (Larsen-Freeman, 2000). Conversely, the teaching technique concerning Communicative Language Teaching, encapsulates the interpersonal intelligence, because of an emphasis on social interaction and a focus on attention to students' learning needs.

Teaching Styles

There are several studies conducted relating to matches and mismatches between teachers' teaching style and learners' learning styles (e.g. Gilakjani, 2012; Sabeh, Bahous, Bacha, & Nabhani, 2011) as well as teachers' and students' ways of knowing and understanding (e.g. Graff, 2006; Bidabadi & Yamat, 2010). Another focus of research is the study of students' conceptions of an effective teacher (Witcher, Onwuegbuzie, & Minor 2001) and students' instructional preferences (Richardson, Kring, & Davis, 1997). The present study adds to the above research, because it investigates the relationship between Iranian EFL teachers' teaching styles and students' ways of learning.

Grasha (2002) defines teaching styles as the consistent and continuous behaviour of teachers in their interactions with students during a teaching-learning process. He asserts that teachers' teaching styles are influenced by many factors, including educational background, teaching curriculum, teaching experience, theoretical knowledge of different language teaching methods and learning dispositions and attitudes. Many scholars proposed different teaching styles and theoretical frameworks (e.g. Grasha, 2002; Mosston & Ashworth, 2002; Sternberg, 1998). Mosston's Spectrum of Teaching (Mosston & Ashworth, 2002) and the theory of Mental Self-government (Sternberg, 1998, 2002) are two highly acknowledged frameworks; however, the present study is framed on the latter theory.

Theoretical Framework

Sternberg's Theory of Mental Self-government

The theory of Sternberg's Mental Self-government (1998, 2002) is about governments of the mind with different levels within this self-government model that include mental functions, forms, levels, scope and leaning. People need to organise or govern themselves according to different kinds of government seen in the table below taken from Sternberg (2002):

Table 1
Summary of Theory of Mental Self-government

Style	Characterization	Example
FUNCTIONS		
Legislative	Likes to create, invent, design, do things his or her own way, have little assigned structure	Like doing science projects, writing poetry, stories, or music, and creating original artworks
Executive	Like to follow directions, do what he or she is told, be given structure	Like to solve problems, write papers on assigned topics, do artwork, form models, build from designs, learn assigned information
Judicial	Like to judge and evaluate people and things	Like to critique work of others, write critical essays, give feedback and advice
FORMS		
Monarchic	Like to do one thing at a time, devoting to it almost all energy and resources	Like to immerse self in a single project, whether art, science, history, business

Hierarchic	Likes to do many things at once, setting priorities for which to do when and how much time and energy to devote to each	Like to budget time for doing homework so that more time and energy is devoted to important assignments
Oligarchic	Like to do many things at once, but has trouble setting priorities	Like to devote sufficient time to reading comprehension items, so may not finish standardized verbal-ability test
Anarchic	Likes to take a random approach to problems; dislike systems, guidelines, and practically all constraints	Writes an essay in stream-of-consciousness form; in conversations, jumps from one point to another; starts things but doesn't finish them
LEVELS		
Global	Likes to deal with big p[picture, generalities, abstractions	Writes an essay on the global message and meaning of a work of art
Local	Likes to deal with details, specifics, concrete examples	Writes an essay describing the details of a work of art and how they interact
SCOPE		
Internal	Likes to work along, focus inward, be self-sufficient	Prefers to do science or social studies project on his or her own
External	Likes to work with others, focus outward, be interdependent	Prefers to do science or social studies project with other members of a group
LEANING		
Liberal	Likes to do things in new ways, defy conventions	Prefers to figure out how to operate new equipment even if it is not the recommended way, prefers open-classroom setting
Conservative	Likes to do things in tried and true ways, follow conventions	Prefers to operate new equipment in traditional way, prefers traditional classroom setting

Zhang and Sternberg (2005) have since reconceptualised the 13 styles of Mental Self-government into three types. The first, Type (I) thinking styles have a tendency towards generating creativity and denoting higher levels of cognitive complexity, including legislative, judicial, hierarchical, global and liberal styles. The second, Type (II) thinking styles are generally favour and denote lower levels of cognitive complexity, including executive, local, monarchic and conservative styles. The third, Type (III) styles can be a combination of Type (I) and Type (II) and include oligarchic, internal, and external. In the present study, however, the focus is on Type (I) and Type (II). Kabadavi (2007) further defines these two types in relation to teaching:

- Legislative style: a learner prefers to work on tasks that require creative strategies to choose activities.
- Judicial style: a learner prefers to work on tasks that encourage self-evaluation.
- Global style: a learner prefers to focus attention on the overall issue to solve problems.
- Liberal style: a learner prefers to work on tasks that involve novelty and ambiguity.
- Executive style: a learner prefers to work on tasks with clear instructions and frameworks.
- Local style: a learner prefers to work on tasks that involve concrete guidelines.
- Conservative style: a learner prefers to work on tasks that allow adherence to existing rules and procedures.

Aim of the Study

The present study employed the Theory of Multiple Intelligences (Gardner, 1983) and the Theory of Mental Self-Government (Zhang and Sternberg, 2005), to assess EFL teachers' and students' individual preferences in relation to styles of teaching and multiple intelligences, respectively. The results of the study are considered to be beneficial for teachers and students in the teaching of English to foreign language learners.

Method

The major reason for incorporating Stenberg's theory of Mental Self-government, Type (I) and (II) (Zhang & Sternberg, 2005), as a basis for the present study was because of its validity and reli-

ability (Plaut, 2008; Zhang & Sternberg, 2002). Sternberg's theory incorporates the Thinking Style Inventory (Sternberg & Wagner, 1992) and the Thinking Style in Teaching Inventory (Grigorenko & Sternberg, 1993) and both were employed to investigate the four research questions, which are documented in the result section.

Participants

Teachers

The participants of the study included 106 voluntary Iranian EFL teachers between the age of 19 and 36 (N=106) from four English Language Institutes in the capital city of Iran, Tehran. They were from different fields in language studies (i.e. TEFL (Teaching English as a Foreign Language), language translation and literature). The participants were categorised into two groups, namely TEFL teachers with a Master of TEFL qualification and NON-TEFL teachers with qualifications in translation and literature at a bachelor's level. These teachers were also categorised according to their age and grouped into three levels: low (19-24), mid (25-30) and high (31-36).

Students

The other participant group included 400 (N=400) EFL learners of starter, elementary and intermediate proficiency levels from the same institutes as their teachers. They were all male and their age ranged from 11 to 17. The criterion for the volunteer learners to qualify, as a participant in the study, related to their final exam test score, which needed to be 75 or more out of 100. The questionnaires were distributed to each participant and, prior to completing the information, members of the research team provided clarification concerning the questionnaire.

Instruments

There were three instruments employed to collect data from participants in this study. Background information was included in the questionnaire to ascertain the age, gender and the field of study of the participants. Student participants completed a questionnaire known as a Student-Generated Inventory (Christison, 1996, 1998). This inventory included 48 statements (6 items for each of the eight intelligences) based on a three point Likert scale ranging from (2) strongly agree, (1) agree, and (0) not agree. The highest score being 12 and 0 for the lowest one. The score for each intelligence was then calculated by adding the items of that intelligence. An SPSS software program was used to the student participant group to calculate the Cronbach alpha reliability of the questionnaire, which was 0.81.

Teacher participants completed two survey questionnaires. A Multiple Intelligence Inventory for EFL/ESL teachers (Christison, 1998), which included 80 items (ten items for each of the eight intelligences) based on a three point Likert scale ranging from (2) strongly agree, (1) agree, and (0) not agree. The highest score for each intelligence being 20 and 0 for the lowest. An SPSS software program was also applied to the teacher participant group to calculate the Cronbach alpha reliability of the questionnaire, which was 0.89.

For this study, the researchers used the Multiple Intelligence Inventory for EFL/ESL (English as a Foreign/Second Language) teachers, which emphasises the use of intelligences in the classroom environment and curriculum development by teachers. The following are some examples from this inventory by teachers: Musical intelligence (I often use chants and music in my lessons); Logical-mathematical intelligence (I use problem-solving activities in my classes); Visual spatial intelligence (I use slides and pictures frequently in my lessons); Bodily-kinaesthetic intelligence (I often do activities in my classes that require the students to move about); Intrapersonal intelligence (I frequently choose activities in the classroom for my students to work on alone or independently); Interpersonal intelligence (My students cooperate with the content and learning process in my classes with their peers).

The second instrument was the Thinkin

Styles in Teaching Inventory (TSTI), which includes 49 statements. Participants rated these on a 7-point response scale, with '1' (one) denoting the statement that 'does not describe these at all', and '7' denoting the statement describing it as 'extremely well'. The inventory assesses seven teaching styles: four styles from Type I, including legislative, executive, judicial and global and, three styles from Type II, being local, liberal and conservative. Seven statements were allocated for each style. The total score for each group of statements were added and divided into seven. The highest and lowest score for each style ranged from 7 to 0. The TSTI proved to be a reliable and valid inventory for assessing the teaching styles of both school teachers and university academics (Zhang, 2007; Zhang, 2004; Sternberg & Grigorenko, 1995). In the present study, the Cronbach alpha reliability of this questionnaire was 0.71.

Results

In this section, first descriptive statistics (mean and standard deviation) of the preferred intelligences for the teacher participants and their teaching styles and, the students' intelligences were considered and research hypotheses were then tested.

To investigate the EFL teachers' preferred types of intelligences, the descriptive statistics are reported. As displayed in Table 2 below, the most preferred type of intelligence was kinesthetic with a mean score of 13.22; followed by spatial intelligence with a mean score of 13.14; linguistic intelligence gained a mean score of 13.12; logical-mathematical intelligences received a mean score of 12.53; musical intelligence scored a mean of 12.39; interpersonal intelligence obtained a mean score of 12.17; and intrapersonal intelligence gained a mean score of 12. The naturalistic intelligence, with a mean score of 8.68, was the least preferred by EFL teachers. It can, therefore, be implied that EFL teachers have a preference for the other seven intelligences, because the mean scores of these intelligences are somewhat higher than noted for the naturalistic intelligence.

Table 2
Descriptive Statistics: Multiple Intelligences of EFL Teachers

	N	Mean	Std. Deviation
	Statistic	Statistic	Statistic
Linguistic	103	13.12	2.788
Music	103	12.39	3.721
Logical Mathematical	103	12.53	3.127
Spatial	103	13.14	3.470
Kinesthetic	103	13.22	3.392
Intrapersonal	103	12.00	3.196
Interpersonal	103	12.17	3.036
Naturalistic	102	8.68	3.779

Table 3 below shows the descriptive statistics for teaching styles of EFL teachers. As displayed in Table 3, the judicial style, with a mean score of 5.52, was the most preferred teaching style by EFL teachers, followed by the liberal style with a mean score of 5.41; the global style of teaching gained a mean score of 5.20; the legislative style received a mean score of 5.10; the executive style obtained a mean score of 4.59; and the local style of teaching gained a mean score of 4.36. The conservative teaching style with a mean score of 3.49 was the least preferred by EFL teachers.

Table 3
Descriptive Statistics: Teaching Styles of EFL Teachers

	N	Mean	Std. Deviation
Legislative	106	5.10	.798
Executive	106	4.59	1.009
Judicial	106	5.52	.743
Global	106	5.20	.898
Local	106	4.36	1.097
Liberal	106	5.41	.899
Conservative	106	3.49	1.036

Descriptive statistics of students' multiple intelligences show their preferred ways of learning and knowing. As displayed in Table 4 below, interpersonal intelligence with a mean score of 8.31 was the most preferred by the EFL student participants, followed by logical mathematical

intelligence with a mean score of 8.19; linguistic intelligence gained a mean score of 7.68; kinesthetic intelligence received a mean score of 7.36; naturalistic intelligences gained a mean score of 7.22; spatial intelligence obtained a mean score of 7.12; and intrapersonal intelligence received a mean score of 6.49. Musical intelligence with a mean score of 6.36 was the least preferred type of intelligence for EFL students.

Table 4
Descriptive Statistics: Multiple Intelligences of EFL Student Participants

	N	Mean	Std. Devtion
	Statistic	Statistic	Statistic
Linguistic	400	7.68	1.891
Music	396	6.36	2.589
Logical Mathemati-cal	400	8.19	2.169
Spatial	400	7.12	2.397
Kinesthetic	399	7.36	2.095
Intrapersonal	399	6.49	2.107
Interpersonal	400	8.31	2.201
Naturalistic	398	7.22	2.579

Correlational analysis

Is there a relationship between EFL teachers' multiple intelligences and their teaching styles?

A Pearson correlation was applied to probe the relationship between EFL teachers' multiple intelligences and their teaching styles. As displayed in Table 5 below, there was a significant relationship between EFL teachers' multiple intelligences and their teaching styles. The results of the analysis showed a positive bug low signify cant relationship between linguistic intelligence and the executive (r=0.202, P=0.037<0.05) and local styles of teaching (r=0.286, P=0.003<0.05). A positive moderate relationship was found between linguistic intelligences and the conservative style of teaching. A positive moderate relationship was also evident between musical intelligence and the global style (r=0.312, P=0.001<0.05).

Moreover, a positive moderate relationship was discovered between logical-mathematical intelligence and the liberal style of teaching (r=0.386, P=0.000<0.05). A negative low relationship was also shown between logical-mathematical intelligence and the conservative style of teaching (r=-0.240, P=0.013<0.05). The results did not show any significant relationship between visual spatial intelligence and EFL teachers' styles of teaching. A positive low relationship was discovered between bodily-kinesthetic intelligence and the local style of teaching (r=0.191, P=0.050<0.05). Another positive low relationship was evident between bodily-kinesthetic intelligence and the conservative style of teaching (r=0.204, P= 0.036<0.05). In consideration of the intrapersonal intelligence, a positive low relationship was found between this intelligence and local (r=0.276, P=0.004<0.05), liberal (r=0.297, P=0.002 <0.05) and conservative (r=0.213, P=0.028 <0.05) styles of teaching. There was no significant relationship evident between interpersonal and naturalistic intelligences and teaching styles.

Table 5
Pearson Correlation: Teachers' MI and Teaching Styles

		Legislative	Executive	Judicial	Global	Local	Liberal	Conservative
linguistic	Pearson Corre-lation	-.022	.202*	-.005	.095	.286**	.073	.347**
	Sig. (2-tailed)	.825	.037	.963	.334	.003	.454	.000
	N	106	106	106	106	106	106	106
music	Pearson Corre-lation	.098	.067	-.012	.312**	.105	-.019	.085
	Sig. (2-tailed)	.319	.495	.903	.001	.285	.843	.387
	N	106	106	106	106	106	106	106

Logical mathematical	Pearson Correlation	.012	-.178	.077	.158	-.057	.386**	-.240*
	Sig. (2-tailed)	.906	.069	.435	.106	.562	.000	.013
	N	106	106	106	106	106	106	106
spatial	Pearson Correlation	-.076	.113	.164	.172	-.043	-.001	-.126
	Sig. (2-tailed)	.442	.250	.093	.078	.658	.992	.199
	N	106	106	106	106	106	106	106
kinesthetic	Pearson Correlation	-.149	.162	-.010	.097	.191*	.164	.204*
	Sig. (2-tailed)	.127	.096	.916	.322	.050	.093	.036
	N	106	106	106	106	106	106	106
intrapersonal	Pearson Correlation	.107	.174	.077	.180	.276**	.297**	.213*
	Sig. (2-tailed)	.275	.074	.435	.064	.004	.002	.028
	N	106	106	106	106	106	106	106
interpersonal	Pearson Correlation	-.130	.018	.034	.167	-.035	.077	.035
	Sig. (2-tailed)	.184	.852	.727	.087	.719	.433	.723
	N	106	106	106	106	106	106	106
naturalistic	Pearson Correlation	.052	-.159	-.117	.137	-.084	.064	-.092
	Sig. (2-tailed)	.597	.106	.234	.163	.392	.515	.350
	N	105	105	105	105	105	105	105
	N	106	106	106	106	106	106	106

Three-way ANOVA

Do age, gender and the field of study have any effect on the multiple intelligences of EFL teachers?

A three-way ANOVA was implemented to investigate the effect of EFL teachers' age level, field of study and gender on their multiple intelligences (As shown in Table 6 below).

Table 6

Three-Way ANOVA of EFL Teachers' Multiple Intelligences by Age, Field of Study and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
AGE	3.237	2	1.619	.574	.565	.012
FIELD OF STUDY	3.426	1	3.426	1.215	.273	.013
GENDER	25.006	1	25.006	8.871	.004	.085
AGE * FIELD OF STUDY	38.883	2	19.441	6.897	.002	.127
AGE * GENDER	42.665	2	21.333	7.568	.001	.137
FIELD OF STUDY * GENDER	6.652	1	6.652	2.360	.128	.024
AGE * FIELD OF STUDY * GENDER	29.904	1	29.904	10.609	.002	.100
Error	267.790	95	2.819			
Total	16088.379	106				

As displayed in Table 7 below, the EFL teachers' age levels do not have any significant effect on their multiple intelligences ($F (2, 95) = .56$, $P > .05$, Partial $\eta^2 = .012$ it represents a weak effect size).

Table 7
Descriptive Statistics EFL Teachers' MI by Age Levels

AGE	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low	11.933	.358	11.223	12.644
Mid	11.869	.309	11.255	12.483
High	11.350	.374	10.608	12.092

As shown in Table 8 below, the EFL teachers' field of study did not have any significant effect on their multiple intelligences. ($F (1, 95) = 1.21$, $P > .05$, Partial $\eta^2 = .013$ and it represents a weak effect size).

Table 8
Descriptive Statistics of EFL Teachers' MI by Their Field of Study

AGE	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
TEFL	12.030[a]	.269	11.496	12.564
NON_TEFL	11.421	.294	10.838	12.004

As shown in Table 9 below, the EFL teachers' gender had a significant and meaningful effect on their use of multiple intelligences ($F (1, 95) = 8.87$, $P < .05$, Partial $\eta^2 = .013$, which indicates a large effect size). Female EFL teachers (12.26) show a slightly higher use of multiple intelligences, compared to males (11.01).

Table 9
Descriptive Statistics of EFL Teachers' MI by Gender

AGE	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
MALE	11.016	.320	10.382	11.650
FEMALE	12.266	.256	11.757	12.775

According to the results, EFL teachers' age and field of study show a significant interaction ($F (2, 95) = 6.89$, $P < .05$, Partial $\eta^2 = .127$ and represents an almost large effect size). The EFL teachers' age and gender show a significant interaction ($F (2, 95) = 7.56$, $P < .05$, Partial $\eta^2 = .137$, which indicates an almost large effect size). The EFL teachers' field of study and gender, however, do not show a significant interaction ($F (1, 95) = 2.36$, $P > .05$, Partial $\eta^2 = .024$ and represents a weak effect size). Therefore, the age levels show a significant interaction with field of study and gender of EFL teachers ($F (1, 95) = 10.60$, $P < .05$, Partial $\eta^2 = .10$ it shows a moderate to an almost large effect size).

Three- way ANOVA

Do age, gender and the field of study have any effect on the teaching styles of EFL teachers?

A three-way ANOVA was applied to investigate the effects of EFL teachers' age level, field of study and gender on their teaching styles (As shown in Table 10 below).

Table 10
Three-Way ANOVA of EFL Teachers' Teaching Styles by Age, Field of Study and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
AGE	.056	2	.028	.106	.900	.002
FIELD OF STUDY	.493	1	.493	1.865	.175	.019
GENDER	.493	1	.493	1.863	.175	.019
AGE * FIELD OF STUDY	1.260	2	.630	2.383	.098	.048
AGE * GENDER	2.320	2	1.160	4.387	.015	.085
FIELD OF STUDY * GENDER	.387	1	.387	1.464	.229	.015
AGE * FIELD OF STUDY*GENDER	.967	1	.967	3.658	.059	.037
Error	25.122	95	.264			
Total	2482.665	106				

As displayed in Table 11 below, the teachers' age levels did not have any significant effect on their teaching styles. (F (2, 95) = .10, P > .05, Partial η^2 = .002 and it represents a weak effect size).

Table 11
Descriptive Statistics of EFL Teachers' Teaching Styles by Age Levels

AGE	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
low	4.739	.110	4.521	4.957
mid	4.851	.095	4.663	5.039
high	4.819	.114	4.592	5.047

As shown in Table 12 below, the EFL teachers' field of study does not have any significant effect on their teaching style (F (1, 95) = 1.86, P > .05, Partial η^2 = .019 and it represents a weak effect size).

Table 12
Descriptive Statistics of EFL Teachers' Teaching Style by Field of Study

AGE	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
TEFL	4.731	.082	4.568	4.895
NON_TEFL	4.873	.090	4.695	5.052

As shown in Table 13, the EFL teachers' gender does not have any significant and meaningful effect on their teaching styles. (F (1, 95) = 1.86, P > .05, Partial η^2 = .019 it indicates a weak effect size).

Table 13
Descriptive Statistics of EFL Teachers' Teaching Style by Gender

AGE	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
MALE	4.896	.098	4.702	5.090
FEMALE	4.736	.078	4.580	4.892

The EFL teachers' age and field of study do not show a significant interaction (F (2, 95) = 2.36, P > .05, Partial η^2 = .048 and it shows an almost moderate effect size). The EFL teachers' age and gender show a significant interaction (F (2, 95) = 4.38, P < .05, Partial η^2 = .085 and it represents an almost moderate effect size). The EFL teachers' field of study and gender do not show a significant interaction (F (1, 95) = 1.46, P > .05, Partial η^2 = .015 and it indicates a weak effect size). Therefore, there is no significant interaction between the EFL teachers' age, field of study and gender (F (1, 95) = 3.65, P > .05, Partial η^2 = .037 and it shows a weak to moderate effect size).

Multivariate ANOVA

Is there any difference between EFL teachers and students' multiple intelligences?

A multivariate ANOVA was used to compare the eight components of the theory of Multiple Intelligences by EFL teachers and students. As displayed in Table 14 below there are significant differences between the teachers and students Multiple Intelligences (F (8, 495) = 21.21, P < .05, Partial η^2 = .255 and it represents a large effect size).

Table 14
Multivariate ANOVA

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.962	1575.80	8	495	.000	.962
	Wilks' Lambda	.038	1575.80	8	495	.000	.962
	Hotelling's Trace	25.467	1575.80	8	495	.000	.962
	Roy's Largest Root	25.467	1575.80	8	495	.000	.962
Group	Pillai's Trace	.255	21.21	8	495	.000	.255
	Wilks' Lambda	.745	21.21	8	495	.000	.255
	Hotelling's Trace	.343	21.21	8	495	.000	.255
	Roy's Largest Root	.343	21.21	8	495	.000	.255

Table 15 below displays the F-values for each of the component of the theory of the Multiple Intelligences by groups.

Table 15
Descriptive Statistics of the Theory of Multiple Intelligences by Two Groups of Participants

Dependent Variable	group	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Linguistic	students	12.819	.153	12.518	13.121
	teacher	13.048	.299	12.460	13.635
Music	students	10.518	.212	10.101	10.935
	teacher	12.495	.413	11.683	13.308
Logical mathematical	students	13.667	.176	13.322	14.013
	teacher	12.657	.343	11.984	13.331
Spatial	students	11.888	.194	11.508	12.269
	teacher	13.162	.378	12.420	13.904
Kinesthetic	students	12.272	.173	11.933	12.612
	teacher	13.210	.337	12.547	13.872
Intrapersonal	students	10.802	.174	10.461	11.143
	teacher	12.000	.339	11.335	12.665
Interpersonal	students	13.876	.175	13.533	14.220
	teacher	12.190	.341	11.521	12.860
Naturalistic	students	11.997	.212	11.579	12.414
	teacher	8.829	.414	8.015	9.642

Based on the results gained from Table 15 above, it can be concluded that:

A: There is no significant difference between teacher participants (Mean = 13.04) and student participants (Mean = 12.81) based on linguistic intelligence (F (1, 502) = .461, P > .05, Partial η^2 = .001 and it indicates a weak effect size).

B: There is a significant difference between teacher participants (Mean = 12.49) and student participants (Mean = 10.51) based on music intelligence (F (1, 502) = 18.10, P < .05, Partial η^2 = .035 it represents a weak to moderate effect size).

C: There is a significant difference between teacher participants (Mean = 12.65) and student participants (Mean = 13.66) based on logical-mathematical intelligence (F (1, 502) = 6.87, P < .05, Partial η^2 = .014 and it shows a weak effect size).

D: There is a significant difference between teacher participants (Mean = 13.16) and student participants (Mean = 11.88) based on spatial intelligence (F (1, 502) = 9.01, P < .05, Partial η^2 = .018 and it shows a weak effect size).

E: There is a significant difference between teacher participants (Mean = 13.21) and student participants (Mean = 12.27) based on kinesthetic intelligence (F (1, 502) = 6.12, P < .05, Partial η^2 = .012 and it represents a weak effect size).

F: There is a significant difference between teacher participants (Mean = 12) and student participants (Mean = 10.80) based on intrapersonal intelligence (F (1, 502) = 9.90, P < .05, Partial η^2 = .019 and it indicates a weak effect size).

F: There is a significant difference between teacher participants (Mean = 12.19) and student participants (Mean = 13.78) based on interpersonal intelligence (F (1, 502) = 19.36, P < .05, Partial η^2 = .037 and it shows a weak to moderate effect size).

G: There is a significant difference between teacher participants (Mean = 8.82) and student participants (Mean = 11.99) based on naturalistic intelligence (F (1, 502) = 46.33, P < .05, Partial η^2 = .085 and it indicates a moderate to large effect size).

Discussions and Conclusions

In educational settings learners may possess different individual traits, learning characteristics and styles (Zhang, 2011). According to Zhang and Sternberg (2006) learners may also prefer different types of resources and display consistent observable patterns of behavior. Some students may learn more efficiently when the type of instruction received is adapted to their ways of learning (Zhang, 2004). According to Gardner (2000) intelligence is a skill that can be used to produce valuable ideas in cultural environments and the ability to solve complex problems. Sternberg (2002), furthermore, views intelligence as a tool for people to adapt or change the environment to fulfill their needs.

Gardner's (2000) Theory of Multiple intelligences postulates that people have many intelligences; however, for the purpose of teaching and learning he focuses on eight intelligences. The results of this study indicates that EFL teachers and learners prefer to employ a range of intelligences. This aligns with a study conducted by Seifuri and Zarei (2011) on the multiple intelligences and concurs that students possess all intelligences but become masters of only certain types.

This study also explores the relationships between EFL teachers' use of multiple intelligences and teaching styles. To investigate any correlation, the instrument used was the Thinking Styles in Teaching Inventory (Grigorenko & Sternberg, 1995). The results show that EFL teachers prefer to incorporate different teaching styles. These findings are consistent with previous studies conducted by Zhang (2004, 2007, and 2011). Interestingly, judicial, global and liberal styles of teaching were preferred more by Iranian EFL teachers. These teachers indicated a preference to constructively critique students work by providing feedback and helpful suggestions for improvement (judicial). Their responses showed an inclination towards incorporating a 'big picture' teaching style that provides a preference for an overall massage, rather than specific details. Iranian EFL teachers also reported an inclination towards creativity by solving problems in new and different ways (liberal).

Significant relationships between constructs of teaching styles and multiple intelligences were also found in this study (e.g. logical-mathematical intelligence and the liberal style; logical-mathematical intelligence and the conservative style; bodily-kinesthetic intelligence and the local style; bodily-kinesthetic intelligence and the conservative style). According to the data from teachers' multiple intelligences and their teaching styles, it is suggested that teachers need to be concerned about their teaching style and to consider the needs and learning styles of students. When teachers plan their unit outline, for example, they should consider all intelligences and teaching styles to cater for the different needs and styles of students.

The teachers' age, field of study and gender are also investigated in this study. These three variables did not show any significant effect on teaching styles. This finding may be due to cultural contexts regarding the study and/or teaching principles and procedures pertaining to the different institutes where teachers work.

Christison (1998) and Armstrong (2000) indicate that a misalignment between the intelligences of teachers and students may affect teaching styles and student's achievement. Before applying the theory of multiple intelligences in the classroom, teachers need to evaluate their own intelligences coupled with their students when designing unit outlines and in the delivery of teaching in the classroom. Christison claims that the first step in teaching EFL/ESL students is for teachers to identify their preferred use of multiple intelligences when teaching. The overall results show there are significant differences between the teachers' use of multiple intelligences in the classroom, and the ways students learn through their preferred use of multiple intelligences.

As a result of the present study the following pedagogical recommendations for EFL teachers and students are suggested as follows: Teachers need to consider their own preferences regarding the use of multiple intelligence when teaching

students; teachers need to focus attention on their preferred teaching styles, for example, legislative, executive, judicial, global, local, liberal and conservative. Teachers should be mindful of the significant relationships between their preferred teaching styles and intelligences, with students' ways of learning and knowing, when choosing teaching methods, classroom activities and assessments.

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