

The Relationship between Iranian EFL High School Students' Multiple Intelligence Scores and their Use of Learning Strategies

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Abstract

According to the theory of multiple intelligences (MI) propounded by Gardner (1983, 1999a, 1999b), each individual has a multitude of intelligences that are quite independent of each other and each individual has a unique cognitive profile. Having access to the MI profiles and learning strategies of learners could help the teachers in planning activities to connect both strategies and students' talents and provide students with the best possible instruction. Thus, this study attempts to find out the relationship between the MI profiles and language learning strategies used by Iranian EFL high school students. Two hundred and twenty-nine students (121 males, 108 females) participated in the study. The instruments used to elicit information for this study were McKenzie's (1999) MI inventory and the Strategy Inventory for Language Learning (SILL) Questionnaire. The findings revealed that there is a low, positive correlation between the two variables of MI and learning strategies, $r = 0.24$. In addition, it was found that there is a low, positive correlation between MI and different strategy types. The highest correlation was seen between meta-cognitive strategies and MI, followed by compensation and cognitive strategies. Furthermore, the findings reveal that Iranian students mostly use meta-cognitive strategies followed by social strategies.

Keywords: Multiple intelligences theory, Language learning strategies, MI inventory, Strategy Inventory for Language Learning (SILL)

1. Introduction

In the area of teaching and learning a second/foreign language, there has been an increasing interest in changing the focus from the teacher-centered classroom to the learner-centered classroom by shifting the focus from the product-orientedness to the process-orientedness of language learning. In this view, the learners are considered as active participants that the effects of teaching will be partly dependant on what they know such as their prior knowledge, what they think about during learning, and their active cognitive processes (Dansereau, 1985; Weinstein & Underwood, 1985). Also, this has brought attention to learning strategies which an individual learner applies during the learning process to facilitate second language learning (Oxford, 1990; Wenden, 1991). That is, how learners' process new information and the kinds of strategies they use to learn, understand, or remember has been the major concern of the second or foreign language researchers.

Language learning strategies (LLS) have been defined as operations employed by the learner to assist in the acquisition, storage, retrieval, and the use of information (Dansereau, 1985; Rigney, 1978) or as steps taken by learners to enhance their own learning (Oxford, 1990). A summary of the various definitions of learning strategies given by some researchers are provided in the following.

Insert Table 1 Here

Learning strategies are important and should be paid attention to because they are one of the major applications of cognitive theory. Oxford (1990) claims that "learning strategies are behaviors or actions which learners use to make language learning more successful, self-directed and enjoyable". Learning strategies are procedures undertaken by the learner, in order to make their own language learning as effective as possible. In O'Malley and Chamot's (1990, p. 52) view, learning strategies are complex procedures that individuals apply to tasks; consequently, they may be represented as procedural knowledge which may be acquired.

Some ESL researchers (e.g., O'Malley, Chamot, Stewner-Manzares, Kupper, & Russo, 1985; Oxford, 1990; Stern, 1992) have classified learning strategies into different categories. For instance, O'Malley et al. (1985, pp. 582-584) divided LLS into three major subcategories, i.e., socio-affective, cognitive, and metacognitive strategies. LLS are also classified by Stern (1992, pp. 262-266) into five main categories that are: a) interpersonal strategies, b) communicative-experiential strategies c) cognitive strategies, d) affective strategies, and e) management and planning strategies. Oxford (1990) has also classified LLS into two major classes i.e., direct and indirect strategies which are further divided into six strategy groups: cognitive, meta-cognitive, memory-related, compensatory, affective, and social strategies that are considered as the most comprehensive classification of learning strategies to date (Ellis, 1994, p. 539).

Currently, the growing interest toward language learning, particularly English, has made the factors that could affect the learning effectiveness more important. As we all know, many factors influence the second/foreign language learning process. However, one of the most important elements for SLA research to explain is the specific strengths and weaknesses that individuals carry out with them in their second/foreign languages respectively. Thus, knowing more about the influence of multiple intelligences on ESL/EFL learners is getting more important.

The term 'intelligence' is traditionally defined as intelligence quotient (IQ) which designates the ratio between mental age and chronological age. In this view, the individuals' abilities are measured via their verbal-linguistic and logical-mathematical intelligences and other types of intelligences are not considered. Gardner (1983) disagreed with such definition of intelligence and challenged the notion that intelligence could be objectively measured and reduced to a single number or "IQ" score. Thus, he stresses that the IQ test does not provide information on other types of intelligences, how to use our minds well and to probe and solve problems.

According to Gardner (1983), each individual has a multitude of intelligences that are quite independent of each other. In this regard, he defined intelligence as "the ability to solve problems or to fashion products that are valued in one or more cultural settings" (Howard Gardner, 1993, p. 15, 2006a, p. 48). He then propounded the theory of MI. Accordingly, he states that,

To my mind, a human intellectual competence must entail a set of skills of problem solving-enabling the individual to resolve genuine problems or difficulties that he or she encounters and when appropriate, to create an effective product-and must also entail the potential for finding or creating problems-thereby laying the groundwork for the acquisition of new knowledge. These prerequisites represent my effort to focus on those intellectual strengths that prove of some importance within a cultural context. (1983, pp. 60-61)

Through the MI theory, Gardner posits that each individual has varying levels of intelligences and each individual has a unique cognitive profile. Seven of the intelligences were introduced in 1983 and later two more were added to the list. They are verbal-linguistic, musical-rhythmic, logical-mathematical, visual- spatial, bodily-kinesthetic, intrapersonal, interpersonal, naturalist and existential intelligences. A brief explanation of each type of intelligence is presented below:

Verbal-linguistic intelligence: the ability to make use of language in an effective way and to express oneself rhetorically or poetically

Logical-mathematical intelligence: the ability to detect patterns and reason deductively and think logically.

Visual- spatial intelligence: the ability to make accurate spatial judgments and mental visualizations of the world. It encompasses the potential to recognize and use the patterns of wide space and more confined areas as well.

Musical-rhythmic intelligence: the capacity to recognize and compose musical pitches, tones, and rhythms.

Bodily-kinesthetic intelligence: the ability to use mental abilities to coordinate bodily movements.

Interpersonal intelligence: the capacity to understand the intentions, motivations and desires of other people

Intrapersonal intelligence: the ability to appreciate and construct a perception of oneself, ensued by a calculated tapping into the personal potentials and resources in the direction of regulating one's life

Naturalist intelligence: the ability to understand nature and recognize, categorize and draw upon certain features of the environment

Existential intelligence: the ability of macro-viewing and understanding in a large context. This type of intelligence seeks connecting to real world understandings and applications of new learning.

Gardner (2009) posited that individuals have jagged cognitive profiles. In other words, a child's strength in fine arts such as music, drawing, and dancing does not so relate with the way that he/she is going to be in other cognitive

areas. Gardner (1993) explained that every child has all nine intelligences and the child has a natural proclivity as a young age towards one or two of the intelligences which last a lifetime. This means that there are dominant intelligences in each individual. In short, Gardner (1983) announced that our mental ability is not unitary or fixed but we possess a blend of cognitive competencies that produce a unique intellectual profile.

As teachers, we have usually seen the students who come to the classroom with different sets of developed intelligences. Thus, there is a need to deal with different students with varying strengths. It may sound impossible to cater for all the different needs of these differing students. However, this is possible if the teacher centers the lesson around the nine intelligences. By encompassing all the nine intelligences, these students will benefit from their different levels of intelligences. Gardner (1987, pp. 187-193) says that “teachers should recognize and nurture all the varied human intelligences, and all the combinations of intelligences”. Lazear (1992) also acknowledge that teachers can show students how to use their more developed intelligences to assist in the understanding of a subject which normally employs their weaker intelligences. The MI theory encourages teachers to acknowledge that all students have strengths and that each individual is unique (Carreiro, 1998; Teele, 2000). Thus, teachers’ should acknowledge different intelligences of the students and prepare student-centered activities that cater to all the students’ intelligences. In this way, students experience success in learning. Kagan and Kagan (1998) state that through this theory, students recognize their own pattern of intelligences and that of their classmates. Students come to celebrate their own uniqueness and honor the diversity they discover among themselves. Thus, recognizing students’ intelligences and learning in a conducive environment are vital for effective learning to take place.

Today, an exam-oriented education system that is focusing only on the verbal-linguistic and logical-mathematical intelligences, is not preparing students for the changing world. Weber et al. (2008) claims that research evidence has shown that students understand deeply when they investigate authentic problems, rather than simply recite back isolated facts on standardized tests. She further states that students enjoy the climate where they think critically and creatively and when they relate classroom instruction to tasks and experiences that they encounter outside of school.

Lazear (1991, 1992) regards MI theory as a solid platform based on which the learners ‘needs, learning strategies, and intelligence models can be studied. He further asserts that the emphasis should not be strictly placed on logical-mathematical and verbal-linguistic intelligences. As far as the school system is concerned, it should provide a rich educational experience where students’ potentials get flourished. Determining the MI profile of EFL students in Iranian schools is an attempt in this direction. Perceiving the intelligence as an ability to solve problems, one can assume that intelligence and learning strategies are of the same nature: one dealing with problems at a broad level (intelligence) and the other tackling just learning problems (LLS). Thus, the present study is designed to investigate quantitatively the relationship between learning strategies and MI scores of Iranian EFL students.

2. Literature review

As the present study is intended to focus on the use of learning strategies and multiple intelligences in Iranian context, this section provides a review of the pertinent literature in Iran.

Investigating whether or not there is any relationship between the use of LLS, foreign language proficiency and IQ scores of Iranian EFL learners, Akbari and Talebinezhad (2003) conducted a study in which they collected data from 128 (45 males, 83 females) English B.A. and M.A. students majoring in English translation and TEFL. The data were collected using three instruments: 1) a retrieved version of a Michigan proficiency test (excluding listening section) - a 100 multiple-choice proficiency test measuring vocabulary, structural, and reading comprehension ability; 2) the Persian version of SILL (Strategy Inventory for Language Learning) - a 50 likert-type questionnaire developed by Oxford (1990); and 3) Cattell scale three intelligence test- a nonverbal, pictorial measure of intelligence which is divided into four subtests, including 50 items (subtest 1=13 items, subtest 2=14 items, subtest 3=13 items and subtest 4=10 items). The researchers reported that there is a positive relationship between the use of LLS and students’ proficiency scores. Compensatory strategies were also found as the best predictor of language proficiency. No significant relationship was found between the participants’ strategy use and their IQ scores. Additionally, they reported that Iranian mostly use metacognitive strategy while affective strategy was used the least.

A study carried out by Razmjoo, Sahragard, and Sadri (2009) was aimed at identifying the relationship between MI, vocabulary learning knowledge and vocabulary learning strategies among Iranian EFL learners. The subjects of the study were 100 senior students who were English language teacher trainees at Shiraz Azad University between 2006 and 2007. To this end, the researcher utilized three instruments namely, Nation's Levels Tests (2001), Schmitt's vocabulary learning strategies (1997), and an adapted version of Nail's (2002) MI questionnaire which contains 80 yes/no items covering the eight intelligences introduced by Gardner (1995). Data analysis of the findings (descriptive and inferential) revealed that there is a relationship between MI and vocabulary learning knowledge. It

was also found that among different domains of intelligence, verbal-linguistic and naturalist intelligences made statistically significant contribution to the prediction of vocabulary learning knowledge.

To determine the relationship between MI and language proficiency, Razmjoo (2008) did a study in which the researcher aimed to investigate the relationship between MI and language proficiency of Iranian EFL PhD candidates, to explore whether one of the intelligence type or a combination of intelligences are predictors of language proficiency, and to examine the effect of gender on language proficiency and types of intelligences. The subjects of the study were 278 (179 males, 99 females) PhD candidates at Shiraz University. An MI questionnaire and a 100-item language proficiency test were distributed among the candidates. The data revealed that there was no significant relationship between language proficiency and the combination of intelligences in general and the types of intelligence in particular. Likewise, no significant difference was found between male and female students and between their MI and language proficiency.

In another study by Mahdavy (2008), the researcher compared TOEFL and IELTS listening tests with MI development by investigating the role of MI in listening proficiency. The subjects of the study were 151 male and female students majoring in English language at a university in Iran. The researcher used three instruments namely, the TOEFL listening test, the IELTS listening test, and the Persian version of MIDAS questionnaire. The process of data collection took 3 weeks to be completed. In the first week, the researcher distributed the MIDAS among the students (N=151) to be completed. After that the data was sent to the author to be scored. One week later, the students participated in the TOEFL listening test and in the following week, 117 of the same participants were given the IELTS listening test. It was found that regardless of the differences between the tests (IELTS & TOEFL), only verbal-linguistic intelligence has a significant influence on the students' listening proficiency. It was also found that verbal-linguistic intelligence is a good predictor of the scores of the listening section in both tests.

Pish Ghadam and Moafian (2008) looked into the role of Iranian EFL teachers' MI in their success in language teaching at high school level. They selected a population of 93 English language teachers from different high schools in Mashhad, a city in the north-east of Iran. At the end of the schooling year, the teachers were asked to fill out the Persian version of MIDAS. Simultaneously, another questionnaire, entitled the Students' View of an Ideal Teacher (in Pish Ghadam & Moafian, 2008) was distributed among the students (N=2287) of the above-mentioned teachers. In using the questionnaire, the researchers aimed at evaluating the performance of teachers regarding their teaching skills, personality, supplementary programs, activities, and social-educational life by their students. Data analysis of the findings revealed that there is a significant relationship between the success of teachers and their interpersonal, verbal-linguistic, and musical-rhythmic intelligences. No significant relationship was found between their success and other types of intelligences. Furthermore, it was found that there was no significant difference between gender and MI regarding the teaching success.

Pasha Sharifi (2008) conducted a study with a group of 120 high school students (grades 10 & 11) of both genders in different branches (academic and technical fields) in the academic year 2004-2005. In order to collect data, the Persian version of MI questionnaire by Harms and Douglas (in Pasha Sharifi, 2008), consisting of 80 statements and covering the 8 categories of MI introduced by Gardner; Bell Adjustment Questionnaire including 140 questions bearing upon home, health, social, and emotional adjustment; and a researcher-made demographic questionnaire were used. The researcher also used the scores of students in some of the lesson subjects (Persian Language and Literature, Foreign language, Mathematics, Physics, Chemistry, Biology, and Designing and mapping) related to the MI items. It was found that there was a low to moderate but significant correlation among different kinds of intelligence and related school subject scores. Additionally, it was found that the female students in the study were superior in intrapersonal intelligence while the male students were superior in visual-spatial intelligence, and there was no significant difference between them regarding other intelligences.

3. Aim of the study

The aim of this study was to investigate the relationship between MI profiles of the Iranian EFL high school students and their use of LLS. More specifically, the study addressed the following research questions:

- 1). With regard to multiple intelligences and language learning strategies:
 - (a) Is there any relationship between language learning strategies used by Iranian EFL learners and their multiple intelligences?
 - (b) Which of the strategy types is significantly correlated with the Iranian EFL students' MI profiles?
- 2). What are the most frequently-used language learning strategies by Iranian EFL students?

4. Methodology

4.1 Participants

A total of two hundred and twenty-nine Iranian EFL high school students (121 males, 108 females), studying in Tehran in the academic year 2008-2009, were randomly selected as the sample of this study. They were from different disciplines (17 humanities, 22 Experimental Science, 28 Mathematics, and 162 others) and different grades (1st year=84, 2nd year=87, 3rd year=58) (see Table 2).

Insert Table 2 Here

4.2 Instruments

The instruments used to elicit information for this study were McKenzie's (1999) MI inventory and the Strategy Inventory for Language Learning (SILL) Questionnaire. The MI inventory consists of 90 Likert-type statements which are related to the nine intelligences set forth by Gardner (1999a, 1999b) with an overall internal consistency of 0.85 to 0.90 (see e.g. Al-Balhan, 2006; Hajhashemi & Wong, 2010; Razmjoo, 2008; Razmjoo, et al., 2009). In order to avoid any difficulty related to the students' foreign language proficiency and to ensure that they can easily follow its items, the researchers utilized the translated version of the MI Inventory (Hajhashemi & Wong, 2010).

SILL was also distributed among the students in order to determine their strategy use. The Inventory that includes 50 Likert-type items was developed by Oxford (1990) and covers six subscales of LLS that are memory, cognitive, compensation, meta-cognitive, affective, and social strategies. In this study, the researchers used the Persian version of SILL which was normed by Tahmasebi (1999) for Iranian learners with cronbach alpha of 0.77.

4.3 Procedure

Undoubtedly, the internal consistency of the questionnaires is vital for the accuracy and reliability of the results. To this end, the Cronbach's alpha for the MI questionnaire and SILL was calculated in a pilot study conducted among 30 Iranian high school students. The overall reliability coefficient for the MI questionnaire was found to be $r = 0.925$, which is considered "very good" according to the guidelines provided by George and Mallery (2003). Hence, the reliability coefficient for the SILL questionnaire was found to be $r = 0.82$ which is acceptable.

Insert Table 3 Here

5. Results and discussions

The first research question in this study includes two parts. The first part attempts to find out the relationship between LLS and MI of Iranian EFL learners. In an attempt to answer this research question, a Pearson correlation was conducted between the overall MI and learning strategies scores to find out the strength and direction of the linear relationship between the two variables. For this purpose, the scores of the nine categories of MI were added together and then divided by nine, to have an overall MI score. The same process was done among the six categories of SILL to have an overall SILL score as well. After that, the correlation between the overall MI and SILL was calculated, using SPSS version 17. The results are shown in Table 4.

Insert Table 4 Here

Based on the findings in Table 4, it was revealed that the correlation between the MI and SILL is $r = .24$, $n=229$, $p<0.01$. The correlation coefficient shows a significant relationship between the variables of MI and SILL. According to Guilford's rule of the thumb (Guilford & Furchter, 1978), there is a low correlation with a definite but small relationship between variables when correlation coefficient is between .20-.40. Based on Guilford's rule of the thumb, the relationship of MI and SILL in the present study ($r \square .20$) is low.

Furthermore, the second part of this research question is to identify the types of strategies that are correlated with the MI profile score. To answer this research question, another Pearson product moment correlation was conducted between MI and different types of learning strategies. The results are shown in Table 5.

Insert Table 5 Here

As shown in Table 5, the results of Pearson coefficient determination analysis are indicative of a low, positive correlation between MI and different strategy types. According to Table 5, the highest correlation does exist between meta-cognitive strategies and MI ($r = .274$, $p<0.01$), followed by compensation and cognitive strategies

Based on the findings for this research question (Table 5), further analysis (another Pearson correlation) was conducted between MI and SILL categories. Among the intelligences, verbal-linguistic, visual-spatial, and logical-mathematical intelligences showed significant correlation with all strategies except memory strategies (see Table 6). Interpersonal intelligence had no significant correlation with any strategy.

Insert Table 6 Here

The final research question of the present study was to investigate the LLS used by Iranian EFL students. As shown in Table 7, the descriptive statistics of the results indicates that Iranian EFL learners are more willing to use meta-cognitive strategies, followed by social strategies.

Insert Table 7 Here

6. Conclusion

The purpose of this paper was to investigate the relationship between MI profiles and LLS used by Iranian EFL high school students. The findings revealed that there is a low, positive correlation between the two variables, $r = 0.24$. A low, positive correlation between MI and different strategy types was another finding of the present study. Also, the highest correlation was found between meta-cognitive strategies and MI, followed by compensation and cognitive strategies. As for the frequency of use of learning strategies, the study shed light on the fact that Iranian students have a stronger tendency to use meta-cognitive strategies, followed by social strategies.

The findings of the present study may serve as recommendations to educators to modify instruction and offer a variety of opportunities for learners in the classroom. They might help educators select a variety of appropriate teaching materials to meet the needs of learners with different abilities. Therefore, prior to choosing any teaching materials, educators should conduct a needs analysis and a test in order to find out the MI profile of the students and to avoid having any mismatch between selected topics and the students' needs.

Finally, the teachers who have the greatest impact on the learning of the students in Iran may find the findings of the present study fruitful in their EFL classes and/ or in designing their own syllabuses. Actually, the findings of this study can help teachers improve their literacy instruction, as they require feedback on their job in order to adjust their instruction to better meet the needs of the students. Thus, one of the implications of the new understanding is that once a teacher has a picture of the students' strengths and weaknesses in different intelligence areas, s/he can help them realize and develop their intellectual capabilities accordingly. Therefore, the findings can provide teachers with further insights into factors involved in determining a MI profile of the Iranian EFL pre-university learners. As far as the MI and learning strategies are concerned, both teachers and learners can use the findings of this study as a guide to improve their EFL classes. Having access to MI profiles and learning strategies of learners will help the teachers in planning activities to connect both strategies and students' talents and provide students with the best possible instruction.

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Table 1. Definitions of Language Learning Strategies

Source	Definition
Stern (1983)	In our view strategy is best reserved for general tendencies or overall characteristics of the approach employed by the language learner, leaving techniques as the term to refer to particular forms of observable learning behavior.
Weinstein & Mayer (1986, p. 315)	Learning strategies are the behaviors and thoughts that a learner engages in during learning that are intended to influence the learner's encoding process.
Chamot (1987)	Learning strategies are techniques, approaches or deliberate actions that students take in order to facilitate the learning, recall of both linguistic and content area information.
Wenden & Rubin (1987, p. 23)	Learning strategies are strategies which contribute to the development of the language system which the learner constructs and affect learning directly.
Cohen (2003)	Learning strategies are conscious thoughts and behaviors used by learners with the explicit goal of improving their knowledge and understanding of a target language.

Table 2. Descriptive Statistics of the Participants

		Frequency	Percent
Gender:	Male	121	52.8
	Female	108	47.2
Discipline:	Humanities	17	7.4
	Experimental science	22	9.6
	Mathematics	28	12.2
	Others	162	70.7
Status:	1 st year	84	36.7
	2 nd year	87	38.0
	3 rd year	58	25.3

Table 3. Cronbach's alpha of the Questionnaires in the pilot study

Questionnaire	N	Cronbach's alpha
MI	30	0.925
SILL	30	0.82

Table 4. Pearson Product-Moment Correlation between overall MI and SILL

	SILL
MI	.237**

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

Table 5. Pearson Product-Moment Correlation between MI and different types of learning strategies

	memory	cognitive	compensation	metacognitive	 affective	social
MI	.54	.223**	.271**	.274**	.154*	.166*

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

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

Table 6. Pearson Product-Moment Correlation between MI & SILL categories

	Memory	Cognitive	Compensation	Metacognitive	Affective	Social
Naturalist	.035	.149*	.129	.208**	.142*	.143*
Musical-rhythmic	.039	.179**	.289**	.240**	.114	.191**
Logical-mathematical	.055	.190**	.247**	.274**	.138*	.192**
Existential	.004	.131	.201**	.193**	.041	.059
Interpersonal	.028	.093	.127	.107	.098	.005
Bodily-kinesthetic	.041	.159*	.155*	.123	.095	.063
Verbal-linguistic	.080	.212**	.244**	.274**	.185**	.176**
Intrapersonal	.017	.155*	.184**	.237**	.118	.139*
Visual-spatial	.100	.200**	.222**	.234**	.182**	.139*

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

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

Table 7. Descriptive Statistics of Respondents' performance on SILL categories

SILL categories	N	Minimum	Maximum	Mean	SD
Metacognitive	229	.56	5.00	2.7424	1.09777
Social	229	.17	5.50	2.6317	1.01487
Memory	229	.33	4.56	2.4008	.74835
Affective	229	.50	4.83	2.3952	.82255
Cognitive	229	.21	6.57	2.3250	.84915
Compensation	229	.33	5.00	2.3057	.79913