Content list available at www.urmia.ac.ir/ijltr

Iranian Journal of Language Teaching Research

Urmia University

Discipline and gender variation in ESP learners' use of metacognitive strategies

Zohreh Seifoori [a, *]

[a] *Islamic Azad University – Tabriz Branch, Iran*

ABSTRACT

Metacognition involves conscious thinking about one's learning and is implemented in language learning when learners set goals and evaluate their performance, plan their studies, use their language knowledge, attend to the input, search speaking and reading opportunities and ways of enhancing their learning outcomes and focus on their errors. This study sought to measure the use of metacognitive strategies by eight groups of Iranian ESP freshmen in four different disciplines and to detect probable discipline and gender variations. Having assessed the initial homogeneity of the groups via Analysis of Variance of the scores obtained from a Key English Test (KET), the researcher administered the Metacognitive section of Oxford's Strategy Inventory for Language Learning (SILL) (1985). The Between-subjects Analysis of Variance (ANOVA) of the research data revealed that the participants studying Mechanical Engineering and Computer outperformed those studying Management and Psychology. Gender variation, however, was observed only in the participants' use of self-evaluation strategy where males reported a more frequent use. The findings revealed the ESP learners' need for metacognitive training particularly across gender and major.

Keywords: discipline; ESP students; gender; metacognition; metacognitive strategies

ARTICLE SUMMARY

Received: 2 Dec. 2013 **Revised version received:** 8 Mar. 2014

Accepted: 24 May 2014 **Available online:** 1 July 2014

* Corresponding author: Department of English, College of Persian Literature & Foreign Languages, Tabriz Branch, Islamic Azad University, Tabriz, Iran
Email address: seifoori2005@yahoo.com

Introduction

Second and foreign language teaching and learning are so intricately interwoven that the putative boundary between the two has long begun to blur. It was traditionally assumed that the function of the former is to direct and manipulate the latter. This conception, or rather misconception, culminated in attempts during the first half of the twentieth century, to expose learners to structurally sequenced language input and to use a multitude of drills to enhance absorption and retention of grammatical and lexical information contained in various stretches of language. Preoccupation with teaching among educators and course designers was based on the conviction that effective teaching methods and procedures would naturally bring about adequate learning experiences for all learners who would be able to retain their learned knowledge and to extend it to more communicative situations. The search for the single panacea was the natural consequence of this conviction embodied in teacher-centered education predominating the methods era.

In the third quarter of the nineteenth century, however, language teachers and second language acquisition (SLA) researchers began to discern the significant role of various learner traits in the process of learning. Further research studies unveiled the influence of individual learner differences such as affective and cognitive resources on both the rate of learning and the learners' final attainments (Allwright, 1984; Ellis, 1985). The new findings challenged the traditional teacher-centered methods of teaching and the subsequent controversy over the mismatch between teaching and learning gradually shifted the focus away from the teaching to the learning process and the factors that could have a bearing on this process such as learning strategies.

Among momentous learner traits that may have a bearing on the language learners' achievement in a language classroom is learners' use of a plethora of strategies. A myriad of studies have addressed learners' strategy knowledge and awareness (Chamot, as cited in Wenden & Rubin, 1987; Flavell, 1979; O'Malley & Chamot, 1990; Oxford, 1989, 1990a) and the application of strategies (Brown, 1987; Coskun, 2010; Cromley, 2005; Livingston, 1997). The findings emerging from these studies suggest that a wide range of cognitive, metacognitive and communication strategies might be effectively used to control numerous aspects of the learning and communication processes. It has also been postulated that all strategies are teachable and compatible with learning tasks and teaching objectives.

Communication strategies seem to be more output-oriented and assist learners to convey their message despite restricted linguistic resources. As such, they are more facilitative in naturalistic contexts where learners get engaged in real communication. Cognitive and metacognitive strategies (CSs/MCSs), on the other hand, are more commonly used in instructed language learning contexts. CSs are, in fact, problem-oriented mechanisms to overcome blocks to understanding while MCSs might be regarded as controlling and monitoring devices which can be deployed to monitor the efficient application of CSs.

The present study was inspired by the insipient concern among language teachers and researchers to investigate the role of metacognitive awareness of cognitive resources and processes in all language skills including reading comprehension. Research on metacognition and reading comprehension dates back to the 1980s when Brown (1980) and Baker and Brown (1984) reported a lack of MCSs by young students who were unaware of what they had comprehended, where their comprehension failed, and what they needed to repair their comprehension failure. Since then, a pattern of steady growth of interest in the relationship between reading comprehension and MCSs like monitoring has been evident which, according to Mokhtari and Reichard (2002), accentuates the central role of metacognition in developing reading comprehension.

Metacognition in reading has been defined as the awareness and monitoring processes which constitute the knowledge of the readers' cognition about reading and the self-control mechanisms they exercise when monitoring and regulating text comprehension (Mokhtari, & Reichard, 2002). It involves conscious thinking about the reading process and is implemented when learners start to manage the reading process by asking themselves various questions while they are reading or after they have accomplished the reading task. Good readers have been reported to monitor their reading, to make predictions and verify them, to reread and summarize a text, and to generate questions which may improve their understanding, often subconsciously (Cromely, 2005). What differentiates them from unskilled readers is their use of general world knowledge in drawing valid inferences from texts, comprehending words, and using comprehension monitoring and repair strategies (Snow, Burns, & Griffin, 1998). This skill entails a rich knowledge of vocabulary, familiarity with the topic, or subconscious use of CSs and MCSs. Poor readers, on the contrary, do fail to monitor their performance on a reading text owing to lack of interest (Pintrich & Schrauben, 1992), limited working memory capacity (Siegler, 1998), limited metacognitive knowledge about reading (Paris & Winograd, 1990), and poor background knowledge (Recht & Leslie, 1988), which can enhance drawing logical conclusions from the text (Neuman, 1990) and direct readers' attention (Brnasford, Brown, & Cocking, 1999).

Reading strategies have been theoretically and operationally defined in terms of 13 global, 8 problem-solving and 9support strategies by Mokhtari and Reichards (2002). Yet, the question is whether and to what extent learners in a reading-focused course use general metacognitive strategies as delineated by Oxford (1985). Despite the skill-based nature of reading strategies, they typically remain at a subconscious level and need to be explicitly instructed ideally in a course where the focus is on reading comprehension. An initial measurement of learners' general metacognitive strategy use seems to function as a need analysis to inform further enquiry in the nature of reading strategies.

MCSs seem to play a more facilitative role in the contexts where English is taught as a foreign language (EFL) particularly those contexts where learners' access to natural flow of oral and written input is highly restricted for some non-pedagogic reasons. Under such conditions, learners' image of language as a medium of communication becomes blurred and may conceivably lead to attenuation of motivation and interest in pursuing academic language studies. Iranian university freshmen are caught in the same precarious pedagogical position. The focus at all educational levels is still on reading comprehension. Learners, nonetheless, often approach a reading task without a prerequisite lexical, grammatical, and topical background which, in turn, changes the task for many of them into a daunting struggle to translate the text despite poor linguistic resources. The same experience characterizes other language skills, as well. Apart from those exceptional learners who have intuitively harnessed their resources and have at their disposal a wide range of multiple strategies, most others barely benefit from various cognitive and metacognitive strategies.

Review of Literature

The need for raising learners' awareness of strategies was felt and stimulated a growing body of research into second and foreign language learners' knowledge and application of various strategies. Mullins (as cited in Oxford & Burry-Stock, 1995) reported the high use of compensatory, cognitive and MCSs among 110 Thai university EFL students as well as a positive relationship between the use of MCSs and proficiency, but did not consider discipline and gender differences.

Ehrman and Oxford's (1995) investigation of 262 English native-speaker government employees studying different foreign languages revealed that the learners used compensation, social, and cognitive strategies followed by metacognitive, memory and affective ones. A weak correlation was also reported between compensation strategies and proficiency. This link was further supported by the results from another study (Green & Oxford, 1995) in which 374 tertiary-level Puerto Rican ESL students at three levels, pre-basic, basic, and intermediate, were studied. The findings indicated significantly higher use of cognitive, compensation, metacognitive, and social strategies among more proficient students. Higher use of memory, metacognitive, affective, and social strategies was also reported among females.

Discipline Variation in MCSs

One of the investigations of discipline differences in strategy use was conducted by Peacock (2001) who used Oxford's (1985) SILL and a 15-minute semi-structured interview with the three students in each discipline with the highest and lowest use of all SILL strategies that were associated with higher levels of proficiency to explore the strategy use of 1006 Hong Kong Chinese learners attending English for Academic Purposes (EAP) classes in 55 City universities. 51% of the participants were males and 49% of them were females with the age range of 18-39, and they came from eight different disciplines: Building and Construction, Business, Computer Studies, Engineering, English, Math, Primary Education, and Science. This study addressed the most frequently used categories of strategies (compensatory, cognitive, and metacognitive) and the relationship between strategy use and proficiency, gender, and discipline.

Descriptive statistics of the research data revealed that "among all students, the most frequently used strategies were the compensation category followed by cognitive and metacognitive, then social, memory, and affective strategies" (Peacock & Ho, 2003, p. 183). Multivariate analysis of variance, on the other hand, indicated a number of disciplinary differences in strategy use like more frequent use of cognitive, metacognitive, and social strategies by students majoring in English and much lower use of MCSs by computer students. Although he did not report discipline differences for individual strategies, frequent use of cognitive and compensation strategies was verified.

Results also showed a statistically significant positive relationship between 27 individual strategies, mostly cognitive and metacognitive, and proficiency. Gender differences were also supported with females (493) reporting significantly higher use of all six strategy categories than males. Although Peacock and Ho (2003) did not report discipline differences for individual strategies, Physics students were found to use significantly fewer CSs and Math students used significantly fewer MCSs.

The ESL learners' use of MCSs in reading was also explored by Sheorey and Mokhtari (2001) who examined 105 American native speakers and ESL university students and reported high awareness of various reading strategies among all participants. In both groups, high-reading-ability participants showed comparable degrees of higher reported use of CSs and MCSs than lower-reading ability students in the counterpart groups. A fundamental difference between ESL learners and native participants, however, was related to the significance they attributed to support reading strategies which were regarded as more important to ESL learners regardless of their reading proficiency.

In response to the scarcity of empirical investigation of the types of MC reading strategies used by EFL and ESL readers in reading English texts, Karbalaei (2010) compared MC reading strategies used by Iranian EFL and Indian ESL learners under a reading comprehension test condition. 93 Indian and 96 Iranian college freshmen and sophomore students majoring in English Translation and Literature participated in his study. The paired *t*-test analysis of the research data obtained

from the Metacognitive Awareness Reading Strategy Inventory (MARSI) administered before and after a reading comprehension test indicated significant differences between EFL and ESL learners' use of MCSs and Support reading strategies, with Indian ESL learners showing a better use. With respect to CSs, however, both groups reported the same use of problem-solving strategies. Based on the findings, the importance of helping both ESL and EFL college readers develop their metacognitive awareness of reading strategies is underscored.

Gender Variation in Metacognitive Strategy Use

Despite the upsurge in autonomous language learning and various learner training programs in the past two decades, the literature on gender difference in reading comprehension, cognitive strategy use in general and metacognitive strategy use in particular is relatively scarce. Spurling and Llyin (1985) have found no gender differences in reading test performance among L2 learners, whereas Chavez (as cited in Phatiki, 2003) has reported a superior performance for females on a multiple-choice reading test. In other studies (Oxford & Nyikos, 1989; Oxford, Lavine, Felkins, Hollaway, & Saleh, 1996) females have been reported to use CSs more frequently than males. A significantly higher use of MCSs by females has also been reported by Green and Oxford (1995) and Sheorey (1999).

However, one of the investigations of gender differences in strategy use in L2 reading was carried out by Phakiti (2003) who examined gender differences in both cognitive and metacognitive strategy use in an EFL reading comprehension test context. He addressed gender differences in L2 reading comprehension performance assessed by a multiple-choice reading comprehension test and in the use of CSs and MCSs. The study was carried out at a prominent university in the north of Thailand with 384 university students who were passing a required Basic English Course (Fundamental English 1) and took the university's final examination in English, immediately followed by a questionnaire on their strategy use.

To analyze gender differences, the researcher used the Multivariate analysis of variance the results of which revealed that males and females did not differ in their reading comprehension performance and their use of CSs. Metacognitive strategy use was the only variable that differed significantly between genders. Based on pairwise comparisons using estimated marginal means, Phatiki (2003) reported a significantly higher use of MCSs by males than by females.

University students form the elites of any society who are educated and trained to assume critical social, political, and economic responsibilities in their future lives. To take on such heavy responsibilities, they need to develop a set of required skills including the ability to approach various problems scientifically and technically and to find efficient solutions. The growth of such abilities entails exposure to the ongoing flow of scientific investigation in various fields taking place worldwide. The results of such scholarly studies are mostly available in English. Hence, an adequate knowledge of English would enable students from various academic disciplines to keep pace with the most recent findings in their fields through a developed reading skill. At higher levels of their academic career, these students will need to make their own contributions to the scholarly communities of which they are a part through conducting research projects and presenting and publishing their research findings in English conferences and journals. Such social and academic contribution entails an advanced level of reading comprehension which can serve as a foundation for a more developed writing skill as well.

University freshmen in non-English academic disciplines are required to pass a three-credit General English Course (GEC) where the focus is on reading and the ultimate purpose is to develop in the learners the ability to apply various reading strategies. Yet, the extent to which these learners apply

MSs has not been explored. MCSs, the ability to monitor one's thinking (monitoring) and to modify one's thoughts and thinking strategies (control), have been suggested as two crucial variables that can play a significant role in enhancing one's reading comprehension skill (Cromely, 2005). Some students use these strategies more or less intuitively owing to a rich body of lexical vocabulary knowledge, familiarity with the topic, and a more natural tendency to concentrate on what is being read. One area of research that may prove highly advantageous in such contexts is identification of students' needs and planning of the teaching materials. One sub-category of students' needs is their awareness and application of various MCSs that are used to manage their own learning (Oxford, 1990b).

Research Objectives

The present enquiry wasinspired by previous investigations addressing learners' application of MCSs in listening and reading comprehension skills (Coskun, 2010; Hong-Nam & Leavel, 2011; Ofodu & Adedipe, 2011),and the relationship between strategic awareness/use and gender (Ehrman & Oxford, 1989; Green & Oxford, 1995; Phakiti, 2003; Sheorey, 1999),and academic discipline (Peacock & Ho, 2003) and two objectives were pursued:

1. To find out Iranian freshmen's use of metacognitive strategies in General English Course (GEC)?
2. To find out probable gender variations in Iranian undergraduate ESP students' metacognitive strategy use in four different disciplines.
3. To find out probable gender variations in Iranian undergraduate ESP students' metacognitive strategy use in four different disciplines use.

Research Questions

The following research questions were formulated to achieve the research purposes:

1. Do Iranian freshmen taking General English Course (GEC) use metacognitive strategies differently?
2. Are there significant discipline variations in Iranian undergraduate ESP students' metacognitive strategy use
3. Are there significant gender variations in Iranian undergraduate ESP students' metacognitive strategy use four different disciplines?

Method

Participants

The research data were obtained from a sample of 240 Iranian college freshmen, 120 females and 120 males, which was, in turn, recruited from a population of approximately 1000 freshmen studying at Islamic Azad University, Tabriz Branch. They were majoring in Mechanical engineering, computer engineering, Management and Psychology and were taking the three-credit General English Course (GEC) as a pre-requisite for a content-based two-credit English for Specific Purpose (ESP) Course. Since the participants were attending 8 intact classes, random sampling was impossible. Yet, to overcome this limitation, the researcher administered an elementary proficiency

test to ascertain initial homogeneity of the groups at the onset of the study and to ensure that all groups would include equal number of male and female participants.

Instruments

Two basic instruments were used to obtain the research data: an elementary proficiency test and the Metacognitive section of Oxford's Strategy Inventory for Language Learning (SILL) (1985). The former was a modified version of the Key English Test (KET, 2005), which is a standardized first level Cambridge English exam for speakers of other languages (ESOL) at elementary level (See Appendix A). Time restrictions at university level and the need to cover the course syllabus left the researcher with no choice but to attenuate the test based on the grammatical features covered in the syllabus and excluding those structures that were not to be dealt with during the course. That is to say, the most relevant items were maintained while those more indirectly related to the course content were excluded prior to actual test administration. The modified test included six different sections: A sentence comprehension section with five matching items, a grammar section with ten three-option items, three vocabulary subsections: a vocabulary test with five three-option questions, a "guessing the word" section based on its description with five three-option questions, and a cloze text with eight blanks and three-option choices; The test also included a reading text entitled "A New Young Player" which contained 195 words followed by seven statements. The participants were required to mark the test items as "Right" (A), "Wrong" (B), and "Doesn't say" (C). The total test score was 40.

The modified KET test was further reviewed by some experienced ESP instructors who verified its content validity and was piloted as a mid-term test with a group of forty students. The reliability estimate of the test was acceptable (.85) given the number of the test items.

The participants whose scores ranged between two standard deviations below and above the means were selected to participate in the study and others were excluded as outliers. The participants' KET scores were subjected to ANOVA and the extreme scores were excluded from further analysis.

The metacognitive subcomponent of the SILL (Oxford, 1985), including 9 items, was translated into the official language, Farsi, to prevent any viable misunderstanding and incomprehension owing to the participants' low proficiency in reading (See Appendix B for the original and the translated versions). The translated questionnaire was presented to some teachers and 15 average students to check the clarity of the items. The questions asked by the students and suggestions from the teachers were taken as feedback based on which the sentences were revised. Further, the questionnaire was piloted with a group of 40 similar freshmen whose answers showed an overall reliability estimate of (.83).

Materials

The primary goal in GECs is to develop the reading skill of Iranian university students in all disciplines and to prepare them to comprehend technical content-based texts despite limited linguistic resources. Hence, the focus of all GECs in this study, likewise other GECs, was on major cognitive or problem-solving reading strategies such as previewing, skimming and scanning, using context clues, taking notes, and making inferences. These strategies are often embedded in various reading texts and learners engage in doing them without knowing about what they are doing and why.

The teaching material covered during the course by ESP students was "Select Readings; Teacher-approved readings for today's students" (Lee, 2011). The course book contained 14 chapters focused on topics like sports in the world, healthy eater, dream homes, along with some guidelines for the teacher in the form of Series Overview where the overall organization of a typical chapter was explained followed by some teaching suggestions. Each chapter included the following sections:

- *Before You Read:* this section contains a pictorial vocabulary preview with some questions or other types of tasks along with one of the following reading strategies: A) scanning; B) previewing (which is a kind of skimming since it includes text-based general questions); C) predicting (based on pictures or some other figures), and answering questions or filling a chart, etc. The students' responses in these activities are later compared with the answers from the text.
- *Reading Passage*: containing 290-340 words focused on an interesting topic, for example Demark Loves Bicycles, A Passion for Cooking, Travel More Spend Less, etc.
- *Understanding the Text*: Embodies some reading skills such as Taking Notes, Making inferences, Using Context Clues all in the form of charts, comprehension questions, understanding the order of events, etc.

Other activities in each unit include some vocabulary and word formation exercises, discussion and writing activities, and Mini-Dictionary assignments.

Procedure

The second session, a whole class discussion was carried out to introduce a number of learner strategies and raise participants' awareness of the various strategies and their role in learning, communicating and monitoring one's learning. Following the discussion, the SILL was administered to the groups to assessthe participants' use of metacognitive strategies. The researcher estimated the frequency with which the subjects used the six MCSs and computed the averages for each item to make them comparable with the averages so obtained with the standard averages for each strategy offered by Oxford (1985). ANOVA was run on the data obtained from the questionnaire, as will be discussed further, to find probable gender and discipline differences in the participants' strategy use and to answer the research questions.

Research Design and Variables

This causal comparative research was undertaken to find out probable variation in gender and discipline among Iranian ESP freshmen's use of metacognitive strategies.

Data Analysis

The research data obtained from the KET were compared via Analysis of Variance to compare the initial homogeneity of the groups across disciplines. Descriptive Statistics of the data obtained from the SILL Questionnaire were further estimated and compared in the form of mean scores and standard deviations for each group of participants. The means were compared via ANOVA to locate probable group differences with regard to the participants' discipline and gender.

Results

First, the descriptive statistics of the KET test scores were estimated and the participants whose scores ranged between two standard deviations below and above the means were selected to participate in the study. One of the conditions for conducting ANOVA analysis is homogeneity of the groups participating in the study. Hence, to ascertain whether the groups were homogeneous or not, the researcher ran the Levene's test of equality of error variances, the results of which confirmed the normality of the data (Sig.= .05). The results of the proficiency test were further submitted to a One-way ANOVA test, the results of which are displayed in Table 1.

Table 1. One-way ANOVA Analysis of the KET

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.20	7	.60	.529	.81
Within Groups	263.20	232	1.13		
Total	267.40	239			

As shown in Table 1, the difference between the eight groups did not reach significance level (F=.529, Sig=.81> .05). Thus, it could be concluded that the groups were homogeneous in terms of their reading, vocabulary, and grammar proficiency in English.

Having assessed the initial homogeneity of the participants, the researcher administered the metacognitive section of the SILL (Oxford, 1985), including nine items, to the participants in all groups. Items 1 through 9 checked the participants' use of the following metacognitive strategies: attempt to use knowledge of English, attention to errors they make, careful listening to English, trying to find out better ways of learning English, time management, extensive reading in English, setting goals, and assessing their progress in English, respectively. Table 2 illustrates the descriptive statistics of the groups' metacognitive strategy use.

As Table 2 shows, the average scores of the participants majoring in Management and Psychology were (2.43, 2.48) for males and (2.38, and 2.50) for females, mostly below the acceptable level (2.5) suggested by Oxford (1985). The participants majoring in Mechanical and Computer Engineering, however, with averages of (3.48 and 2.73) for males and (2.50 and 2.51) were at or above the acceptable level. Management and Psychology students' use of the strategies was found to be mostly below the acceptable level (2.5), as suggested by Oxford (1985), whereas Mechanical and Computer Engineering students were well above the mean.Hence, the answer to the first research question is positive: Iranian Freshmen taking General English Course (GEC) use metacognitive strategies differently. Nevertheless, to investigate the significance of the difference and any probable impact from discipline and gender, the researcher first ran Levene's test of equality of error variances which indicated that the homogeneity of variances for each of the dependent measures, or items, was not violated in the data set ($p > .05$).

Table 2. The Descriptive Statistics of the Participants' Metacognitive Strategy Use

		Manage.		Psych.		Mech.		Comp.	
N		60		60		60		60	
		M	SD	M	SD	M	SD	M	SD
1	I try to find as many ways as I can to use my English.	2.58	.84	2.15	.79	3.18	1.12	4.3	1.00
2	I notice my English mistakes and use that information to help me do better.	2.73	.89	2.36	.91	3.63	1.16	4.05	.96
3	I pay attention when someone is speaking English.	2.58	.61	2.31	.98	3.40	1.09	3.88	1.10
4	I try to find out how to be a better learner of English.	2.16	.76	2.86	1.01	4.00	.84	3.96	1.02
5	I plan my schedule so I will have enough time to study English.	2.21	.88	2.93	1.30	3.25	1.44	3.40	1.36
6	I look for people I can talk to in English.	2.41	1.07	2.20	1.03	2.91	1.41	3.13	1.35
7	I look for opportunities to read as much as possible in English.	2051	1.17	2.33	1.08	2.85	1.32	3.10	1.33
8	I have clear goals for improving my English skills.	2.36	1.10	2.78	1.30	2.88	1.42	2.96	1.16
9	I think about my progress in learning English.	2.26	.91	2.18	1.11	2.63	1.27	2.98	1.43

Having determined that the results met the required assumptions, the researcher, further, submitted the data from the questionnaire to a Between-subjects ANOVA test in order to find out the probable impacts from the participants' discipline and gender on their metacognitive strategy use, the results of which are displayed in Tables 3 below.

Table 3. Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Item1	121.65[a]	4	30.41	33.50	.000
	Item2	111.80[b]	4	27.95	28.56	.000
	Item3	95.87[c]	4	23.96	25.52	.000
	Item4	144.79[d]	4	36.19	43.13	.000
	Item5	50.55[e]	4	12.63	7.83	.000
	Item6	39.02[f]	4	9.75	6.47	.000
	Item7	25.15[g]	4	6.29	4.16	.003
	Item8	13.27[h]	4	3.31	2.09	.082
	Item9	25.63[i]	4	6.40	4.45	.002
Discipline	Item1	118.16	3	39.38	43.39	.00
	Item2	108.68	3	36.22	37.01	.00
	Item3	93.64	3	31.21	33.25	.00
	Item4	142.58	3	47.52	56.63	.00
	Item5	49.94	3	16.64	10.32	.00
	Item6	33.21	3	11.07	7.34	.00
	Item7	20.51	3	6.83	4.52	.00
	Item8	12.72	3	4.24	2.68	.04
	Item9	23.79	3	7.93	5.51	.00
Gender	Item1	1.84	1	1.84	2.03	.15
	Item2	2.46	1	2.46	2.51	.11
	Item3	1.52	1	1.52	1.62	.20
	Item4	1.99	1	1.99	2.37	.12
	Item5	.71	1	.71	.44	.50
	Item6	5.39	1	5.39	3.57	.06
	Item7	4.12	1	4.12	2.72	.10
	Item8	.50	1	.50	.32	.57
	Item9	1.33	1	1.33	.92	.33

Discipline and Strategy Use

The second research question addressed any probable effects of discipline on Iranian freshmen's use of metacognitive strategies. As it is illustrated in Table 4, there was a significant main effect for discipline. According to Table 3, the participants majoring in Mechanical and Computer Engineering used metacognitive strategies more frequently than those majoring in Management and Psychology. Hence, the answer to the second research question is positive, that is Iranian University freshmen use metacognitive strategies differently. It might be cautiously suggested that Mathematical science students are more metacognitively aware than students who study human and social sciences.

Gender and Strategy Use

The third research question delved into the effect of gender on Iranian freshmen's strategy use. The mean scores of the male and female participants' use of metacognitive strategies are illustrated in Table 4 belowto better understand the difference.

Table 4. The Mean of the Male and Female Participants' Use of Metacognitive Strategies

Gender:		Males	Females
Number:		120	120
1	I try to find as many ways as I can to use my English.	3.10	2.86
2	I notice my English mistakes and use that information to help me do better.	3.31	3.08
3	I pay attention when someone is speaking English.	3.14	2.95
4	I try to find out how to be a better learner of English.	3.40	3.59
5	I plan my schedule so I will have enough time to study English.	2.89	3.00
6	I look for people I can talk to in English.	2.82	2.51
7	I look for opportunities to read as much as possible in English.	2.84	2.56
8	I have clear goals for improving my English skills.	2.79	2.70
9	I think about my progress in learning English.	2.60	2.42

Table 4 displays differences in the use of all ten metacognitive strategies by male and female participants. Although slight variations were observed in male and female participants' use of metacognitive strategies, the difference, as illustrated in Table 3, did not reach significance.

Discussion

Research endeavors addressing learners' application of MCSs in listening and reading comprehension skills (Coskun, 2010; Hong-Nam & Leavel, 2011; Ofodu & Adedipe, 2011), as well as the effect of gender (Ehrman & Oxford, 1989; Green & Oxford, 1995; Phakiti, 2003; Sheorey, 1999) and academic discipline (Peacock & Ho, 2003) on the application of such strategies inspired the present study which dealt with Iranian male and female ESP freshmen's use of metacognitive strategies from four different disciplines: Management, Psychology, Mechanics, and Computer.

Iranian ESP Learners' Metacognitive Strategy Use

In line with Ehrman and Oxford (1989) and Green and Oxford (1995) who reported metacognitive strategies as the least frequent strategies, the results emerging from the present study displayed that the averages of metacognitive strategy use by Iranian freshmen were below the acceptable minimum level of (2.5), as specified by Oxford (1985). This poor strategy application might be pertained to overemphasis on discrete knowledge of grammar and vocabulary at early stages of language learning. The participants' poor strategy use might have been reinforced by the adherence at undergraduate English pedagogy to a more or less focus on forms approach. As a result of this approach, reading comprehension which dominates the teaching content at high school level is treated as a language learning activity where students practice grammar and vocabulary. This approach is completely congruent with the mechanical views of language learning and teaching characterizing the Audiolingual Method. Hence, one of the essential implications of the present study is the immediate need for supplementing the normal English pedagogy with some embedded

or distinct strategy training activities at least at undergraduate level. Of course, more longitudinal process-oriented enquiries are required to pinpoint more precisely the localized needs of the learners and thereby to lay down the scope of such activities.

Discipline Variation in Metacognitive Strategy Use

As for discipline variation in strategy use, Mechanical and Computer Engineering students were found to use metacognitive strategies more frequently than those majoring in Management and Psychology. The difference might be elucidated in varying mental sets attributed to each of these groups. Of course, further study is required to investigate such individual variables as dominant intelligence types, learning styles and various strategy uses before arriving at definite conclusions. Nonetheless, more compelling documentary evidence obtained from learner-focused studies is needed to first identify probable variations in the use of other strategy types by ESP learners' and further to investigate the likelihood of any relationship between such strategy use and other individual characteristics. The findings, as they are, however, suggest the greater need of students studying in human sciences for metacognitive strategy training.

Gender Variation in Metacognitive Strategy Use

The difference between male and female learners did not reached significance level. Second and foreign language learners' knowledge and application of various strategies have been investigated globally. The findings from this research run counter to the findings of Phatiki (2003) who reported a significantly more frequent use of MCSs by males than by females.

Except for items 4 and 5, male participants were found to employ metacognitive strategies more frequently than females. This slight difference might be interpreted in terms of the social, contextual factors that govern the social roles and relationships. In some communities, males are regarded as more directly responsible for the financial running of the family. To them, then, it is of crucial importance to take advantage of all opportunities to develop required skills and qualifications that may count in their professional career. Females, on the other hand, have a passion for learning for the sake of learning because they are not socially responsible, and subsequently, not as pre-occupied with worries as males. These varying social roles might naturally attenuate their incentive to self-monitor their progress in English. Further investigation of variations in the use of other strategies along with more direct data collection procedures such as interviews might shed light on our understanding of the genuineness of such a difference and the intervening factors that may play a role.

Conclusion

Application of various strategies is reinforced in real acts of communication where the focus is on exchanging meaning to achieve a goal. Yet, the EFL context in Iran is highly restricted in terms of genuine exposure outside the classroom. Learners are deprived of the opportunities to put their declarative knowledge of language acquired through formal instruction to communicative use. In the face of this communicative adversity, ESP learners need to develop a communicative command of English that allows them to access updated academic materials and to make their own contribution to the development of knowledge and technology worldwide. Strategy training and metacognitive awareness-raising seem to offer a way out of this pedagogical predicament. Metacognitive training can be proposed as a method of elevating teaching in GE courses at university level where the focus is on reading comprehension as the most essential language skill.

Realigning the teaching process with a more learner-friendly system might prove effective in fostering the typical counter-productive learning experiences in such courses and help the learners improve their monitoring of the text. A concise introduction of various cognitive and MCSs can raise learners' awareness and be complemented by planning appropriate pre-task activities like activating background and directing attention, during task activities such as monitoring and questioning and post-task activities like evaluating.

References

Allwright, D. (1984). Why don't learners learn what teachers teach: The interaction hypothesis. In D. Singletone & D. Little (Eds.), *Language learning in formal andinformal contexts* (pp. 3-18). Dublin: IRAL.

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P.D. Pearson (Ed.), *Handbook of reading research* (pp. 353-394). New York: Longman.

Brnsford, j., Brown, A., & Cocking, R. R. (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

Brown, A. L., (1980). Metacognitive development and reading. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 453-481). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Brown, A. L., (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65-116). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Coskun, A. (2010). The effect of metacognitive strategy training on the listening performance of beginner students. *Novitas-ROYAL, Research on Youth and Language, 4*(1), 35-50.

Cromley, J. G. (2005). Metacognition, cognitive strategy instruction, and reading in adult literacy. *Review of Adult Learning and Literacy, 5*, 187-204.

Ehrman, M., & Oxford, R. (1989). Effects of sex differences, career choice, and psychological type on adult language learning strategies. *Modern Language Journal, 73*, 1-13.

Ellis, R., (1985). Sources of variability in interlanguage. *Applied Linguistics, 6*(2)*,* 118-131.

Ehrman, M. E., & Oxford, R. (1989). Effects of sex differences, career choice, and psychological type on adult language learning strategies. *Modern Language Journal, 73*, 1-13.

Flavell, J. H. (1979). Metacognition and cognitive monitoring; A new area of cognitive-developmental inquiry. *American psychologist, 34,* 906-911.

Green, J. A., & Oxford, R. (1995). A close look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly, 29*, 261-297.

Hong-Nam, K., & Leavel, A.G. (2011). Reading strategy instruction, metacognitive awareness, and self-perception of striving college developmental readers. *Journal of College Literature & Learning, 37*, 3-17.

Karbalaei, A. (2010). A comparison of the metacognitive reading strategies used by EFL and ESL readers. *The Reading Matrix, 10* (2), 165-180.

Livingston, J. A. (1997). Metacognition: An overview. Retrieved from http://www.gse.buffalo.edu/fs/shuell/cep564/Metacogn.htm.

Mokhtari, K., & Reichard, C. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology, 94*(2), 249-259.

Neuman, S. B. (1990). Assessing children's inferencing strategies. In J. Zutell & J. McCormick (Eds.), *Literacy theory and research: Analyses from multiple paradigms* (pp. 267-274). Chicago: National Reading Conference.

Ofodu, G.O., & Adedipe, T.H. (2011). Assessing ESL students' awareness and application of metacognitive strategies in comprehending academic materials. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS), 2*(5), 343-346

O'Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.

Oxford, R., (1985). *A new taxonomy of second language learning strategies*. Washington, DC: Centre for Applied Linguistics.

Oxford, R. (1989). Use of language learning strategies: A synthesis of studies with implications for strategy training. *System, 17*(2), 235-247.

Oxford, R. (1990a). Language learning strategies and beyond: A look at strategies in the context of styles. In S. S. Magnan (Ed.), *Shifting the instructional focus to the learner* (pp. 35-55). Middlebury, VT: Northeast Conference on Teaching of Foreign Languages.

Oxford, R. (1990b). *Language learning strategies: What every teacher should know*. Englewood Cliffs, NJ: Newbury House.

Oxford, R. & Burry-Stock, J. A. (1995). Assessing the use of language learning strategies worldwide with the ESL/EFL version of the Strategy Inventory of Language Learning (SILL). *System, 23*(1), 1-23.

Oxford, R., Lavine, R. Z., Felkins, G., Hollaway, M.E., &Saleh, A., (1996). Telling their stories: Language learners use diaries and recollective studies. In R. Oxford (Ed.), *Language learning strategies around the world: Cross- cultural perspectives* (pp. 19-34). Honolulu: University of Hawaii.

Oxford, R., & Nyikos, M. (1989). Variables affecting choice of language learning strategies by university students. *Modern Language Journal, 73*, 291-300.

Paris, S. G., & Winograd, P. (1990). How metacognition can promote academic learning andinstruction. In B. F. Jones & L. Idol (Eds.), Dimensions of thinking and cognitive instruction (pp. 15-51). Hillsdale, NJ: Erlbaum.

Peacock, M. (2001). Match or mismatch? Learning styles and teaching styles in EFL. *International Journal of Applied Linguistics, 11*(1), 1-20.

Peacock, M., &Ho, B. (2003). Student language learning strategies across eight disciplines. *International Journal of Applied Linguistics, 13*(2), 1-20.

Phakiti, A. (2003). A closer look at gender and strategy use in L2 reading. *Language Learning, 53*(4), 649-702.

Pintrich, P. R. Y. & Schrauben, B. (1992). Students' motivational beliefs and their cognitive engagement in classroom academic tasks. In D. H. Schun, & J. L. Meese (Eds.), *Student perceptions in the classroom* (pp. 149-184). Hillsdale, NJ: Lawrence Erlbaum Associates.

Recht, D. R. & Leslie, L. (1988). Effect of prior knowledge on good and poor readers' memory of text. *Journal of Educational Psychology, 80*(1), 16-20.

Sheorey, R. (1999). An examination of language learning strategy use in the setting of an indigenized variety of English. *System, 27,* 173-190.

Sheorey, R. & Mokhtari, K. (2001). Differences in the metacognitive awareness of reading strategies among native and non-native readers. *System, 29*, 431-449.

Siegler, R. (1998). *Children's thinking* (3rd ed.) Upper Saddle River, NJ: Prentice Hall.

Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

Spurling, S., &Llyin, D. (1985). The impact of learner variables on language test performance. *TESOL Quarterly, 19,* 283-301.

Wenden, A., & Rubin, J. (Eds.). (1987). *Learner strategies in language learning.* Cambridge: Prentice-Hall.

Zohreh Seifoori is an assistant professor at Islamic Azad University, Tabriz Branch. She is interested in individualizing learning for learners and teacher trainees through the use of tasks, strategies, and multiple intelligences. She has published a number of articles in national and international journals and presented papers at international conferences.

Appendix A: Key English Test

Part 1

Questions 1-5: Which notice (A-F) says this (1-5)? For each questions 1-5, write the correct letter A-H on your answer sheet.

1. You should be careful because this will burn.

2. You shouldn't talk loudly here.

3. You pay the same but you get more.

4. You should keep this in a cool place.

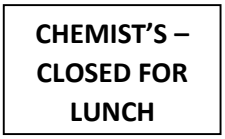
5. Be careful when you cross the road.

A.

B.

C.

D.



E.

F.

Part 2

Questions 11-20, English Grammar Read the sentences and choose the best answer. Write the letter in your answer sheet.

6. I like …. Languages at school.
A. learning B. to learn C. learn

7. I would like ….. in another country.
A. working B. to work C. work

8. Are you planning ……. Me next week?
A. visiting B. visit C. to visit
9. Last week we decided ……. to the cinema.
A. going B. to go C. go
10. Marios and Yiannis …… bowl last weekend.
A.go B. went C. are going
11. Christina always ….. her homework before she calls her friends!
A. does B. do C. is doing
12. When we went camping we …. a really good time.
A. have B. having C. had
13. My brother ….. a lot of time studying. He's very clever.
A. spend B. spent C. spends
14. Paula's mum …. Her a wonderful birthday cake last year.
A. makes B. made C. make
15. I started to …. The guitar when I was six years ole.
A. play B. played C. playing

Part 3

Questions 6-10, Vocabulary: Read the sentences about going shopping. Choose the best word (A, B, or C) for each space. Then, write the correct letter on your answer sheet.

16. They …. to go to the new shopping center in town.
A. Thought B. decided C. felt

17. They wanted to buy some new sports …. to wear.
A. Clothes B. games C. videos

18. They went to their … shop and looked at all the things there.
A. Extra B. favorite C. interesting

19. Pietro chose a baseball …. and Giovanni bought a pair of socks.
A. Suit B. consume C. cap

20. ….., the boys met some friends and went to the cinema.
A. Again B. Later C. Now

Part 4

Questions 21-25: Read the descriptions of things to take on holiday. What is the word for each one? The first letter is already there. There is one space for each other letter in the word. Write the words on you answer sheet.

21. When you go away on holiday, you pack your clothes in this. S _ _ _ _ _ _ _
22. You need to take this if you are going to sleep on a campsite. T _ _ _
23. If you have this, you can take photographs of your holiday. C _ _ _ _ _

24. Take some of this in a bottle to the beach because you might get thirsty W _ _ _ _

25. You need this to clean your teeth. T _ _ _ _ _ _ _ _ _

Part 5

Questions 26-33, Vocabulary: Read the article about the sharks and whales. Choose the best word (A, B, or C) for each space. Write A, B, or C on your answer sheet.

SHARKS AND WHALES

There are many different types of shark but the (26) …….. famous of all is the Great White Shark. Some (27) ……. these sharks weigh nearly two thousand kilos and can be six meters (28) …… However, the Blue Whale is much (29) …….. It can weigh as much (30) ……. thirteen thousand kilos and is often more (31) ……. thirty meters long.

Although the Blue Whale is so big, (32) …… is much less dangerous than the Great White Shark. The Great White is the most dangerous thing in the sea. It finds its food close (33) …….. beaches where the water is not too deep and has killed people swimming in the sea. A Great White Shark's stomach (34) ……. often bigger than a human adult.

26.	A. of	B. from	C. for
27.	A. long	B. tall	C. high
28.	A. big	B. bigger	C. biggest
29.	A. to	B. for	C. as
30.	A. than	B. that	C. and
31.	A. he	B. it	C. they
32.	A. on	B. to	C. at
33.	A. is	B. are	C. be

Part 6

Questions 34-40, Reading Comprehension: Read the article about a young boy who wants to be a footballer. Are sentences 34-40 "Right" (A) or "Wrong" (B)? if there is not enough information to answer "Right"(A) or "Wrong" (B), Choose "Doesn't say" (C). For questions 34-40, Write A, B, or C on your answer sheet.

A NEW YOUNG PLAYER

For our interview this week, we talked to Jamie Zvenison, the newest and youngest football player with the Manchester United Young Players team. Jamie was in a football skills competition with fifteen other young players and he was the winner! Jamie is still very young, only sixteen, but now he's going to play for Manchester United. He told me that he feels very happy and excited about this because he has always dreamed of playing football for a famous club. He has played football all his life and he remembers scoring his first goal at school when he was only six years old!

Because Jamie has to spend a lot of time with the Manchester United Young Players team, he can't go to school. Lucky him! But the club makes sure he continues his lessons with a teacher at his home so Jamie does not miss anything from school, including homework! Jami is able to phone his friends every day and sometimes he sends them an email. He can't see them as much as he wants to but they often come to watch him play football for the Manchester United Young Players team at weekends.

34. All the players in the competition now play for Manchester United. A. B. C
35. Jamie is too young to play for Manchester United. A. B. C
36. Jamie is pleased about playing for Manchester United. A. B. C
37. Jamie scored his first goal at the age of six. A. B. C
38. Jamie is with the team every day of the week. A. B. C
39. Jamie doesn't have to do any school work. A. B. C
40. Jamie sometimes sees his friends during the week. A. B. C

Answer Sheet
Name: …… **Major:**……..
Part 1: Sentence Comprehension

1. …. 2. ….. 3. ….. 4. …… 5. ……
Part 2: Grammar

6. …. 7. …. 8. ….. 9. …… 10……
11…. 12 . ….. 13. ….. 14. …… 15. ……
Part 3: Vocabulary

16…. 17….. 18. ….. 19. …… 20……
Part 4; Vocabulary

21…. 22 . ….. 23. ….. 24. …… 25. ……
Part 5: Vocabulary

26…. 27 . ….. 28. ….. 29. …… 30. ……
31…. 32. ….. 33. …..
Part 6: Reading Comprehension

34. …… 35. …… 36……. 37……. 38. …… 39……
40……..

Appendix B: The Original Metacognitive Strategy Inventory for Language Learning (SILL)

You will find statements about learning English. Please read each statement and write the response (1, 2, 3, 4, or 5) that tells HOW TRUE THE STATEMENT IS.

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

There are no right or wrong answers to these statements. Do not answer how you think you should be, or what other people do. Answer in terms of how well the statement describes you.

Part D of the SILL		**1**	**2**	**3**	**4**	**5**
30	I try to find as many ways as I can to use my English.					
31	I notice my English mistakes and use that information to help me do better.					
32	I pay attention when someone is speaking English.					
33	I try to find out how to be a better learner of English.					
34	I plan my schedule so I will have enough time to study English.					
35	I look for people I can talk to in English.					
36	I look for opportunities to read as much as possible in English.					
37	I have clear goals for improving my English skills.					
38	I think about my progress in learning English.					

Appendix B: The Translated Version of Metacognitive Strategy Inventory

پرسشنامه راهبردهای فراشناختی

این پرسشنامه حاوی جملاتی در مورد آموزش زبان انگلیسی می باشد. لطفا هر جمله را به دقت بخوانید و با انتخاب گزینه مناسب بگویید تا چه حد این جمله در مورد شما صدق می کند. لطفا با توجه به واقعیات کنونی گزینه ایی را انتخاب کنید که شیوه آموزش انگلیسی شما را چنان که هست توصیف می کند، نه آنچنانکه فکر می کنید باید باشد. ده دقیقه برای پاسخگویی فرصت دارید. لطفا سئوالات خود را از استاد بپرسید.

نام: رشته تحصیلی: مونت ◯ مذکر ◯		هرگز	بسیار کم	گاهی	بیشتر اوقات	همیشه
۱	سعی می کنم به شیوه های گوناگون از دانش زبانی خود استفاده کنم.					
۲	به اشتباهات زبانی خود توجه می کنم و سعی می کنم از اطلاعات حاصل از این توجه در بهبود آموزش انگلیسی خود بهره جویم.					
۳	به گفتار انگلیسی دیگران به دقت گوش فرا می دهم.					
۴	تلاش می کنم شیوه های آموزش بهترزبان انگلیسی را بیابم.					
۵	با برنامه ریزی زمانی تلاش می کنم وقت کافی برای مطالعه انگلیسی برای خود فراهم کنم.					
۶	به دنبال افرادی هستم که بتوانم با آنها انگلیسی صحبت کنم.					
۷	از هر فرصتی برای خواندن متون انگلیسی استفاده می کنم.					
۸	برای بهبود مهارتهای زبانی خود اهداف روشنی دارم.					
۹	به چگونگی پیشرفت زبانی خود فکر می کنم .					