

Strategy use, learning styles and L2 achievement of Iranian students of English for academic purposes

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The present study investigated the relationship between language learning strategy use, learning styles, gender, and second language (L2) achievement of Iranian English for academic purposes (EAP) learners. To this end, 120 Iranian EAP learners majoring in various fields of humanities including political sciences, psychology, economics and law participated in the study by completing Oxford's (1990) *Strategy Inventory for Language Learning* (SILL), and an adapted version of the *Perceptual Learning Style Preference Questionnaire* (PLSPQ) originally developed by Reid (1987). The results obtained from three separate Pearson product moment correlations indicated that there was a significant positive correlation between (a) language learning strategy use and L2 achievement; (b) learning styles and L2 achievement; and (c) learning styles and strategy use by Iranian EAP learners. Moreover, the results of multiple regression analysis demonstrated that both learning styles and language learning strategy use were significant predictors of the participants' L2 achievement; however, learning styles were found to be a stronger predictor. Also, the findings of two separate multiple regression analyses indicated that among the components of learning styles and language learning strategies, visual learning style and cognitive strategy use were stronger predictors of L2 achievement respectively. In addition, the results of an independent samples t-test showed cognitive and metacognitive strategies were the most frequently used strategy groups by females and males respectively. The results of another independent samples t-test indicated that group and visual learning styles were the most preferred types adopted by the female and male learners respectively.

Introduction

One of the major trends in contemporary foreign language learning is attempting to raise students' awareness of individual differences in learning and their striking effects on the learning process (Sadeghi, Kasim, Tan & Abdullah, 2012). During the past few decades, educators have come to a consensus on the view that a worthy education includes teaching students how to learn and remember, and how to become motivated (Weinstein & Mayer, 1986).

In general, different types of information are learned in various and numerous ways. Brown (1994) believed that learning can be more effective when the students learn through their own initiatives. Their motivation, performance and achievement increase when their learning styles and strategies are coordinated with appropriate procedures. According to Allwright and Bailey (1991), learning strategies can also enable students to become more independent, autonomous, and lifelong learners. In addition, Griffiths (2013) believed that learners bring learning styles and experiences to learning contexts that might either contribute to learning or hinder them from future success in academic environments. Thus, the incorporation of learning styles and background experiences in learning contexts can play a key role in successful teaching and proper learner

achievement. Moreover, for many new undergraduate students, entering university can be a stressful experience. One of their important challenges is the need to develop proper habits of learning and to adopt appropriate learning strategies based on the given academic environment (Bruinsma, 2004).

The significance attached to learning strategies and styles has increased recently as the importance of language learning has been growing all over the world. Every learning process requires the adoption of specific learning styles and strategies in order to achieve the main purpose of learning. Also, as Dunn and Griggs (1990) argued, encouraging learners to activate their own learning styles and strategies can enhance learning. On the other hand, as Farhady and Hedayati (2009) maintained, EAP courses in Iran are usually presented in the form of traditional, form-focused teaching methods which lead to ineffectual outcomes for both the students and the educational system. In addition, what is taught in Iranian EAP classes does not support any specific instruction, because teachers neither set any desirable objectives, nor do they adopt appropriate instructional methodology.

Due to the importance of the aforementioned constructs in language learning, attempts were made in the present study to investigate the possible relationship between language learning strategies, learning styles, gender, and L2 achievement of Iranian EAP learners. The findings can provide EAP materials developers and course book writers as well as EAP teachers with some insights to focus on the learning styles and strategies that suit the given learners in the given teaching and learning context.

Language learning strategy use

The word strategy is believed to be rooted in the old Greek concept 'strategia', "which means steps or actions taken for the purpose of winning a war. The warlike meaning of the word 'strategia' has fallen away, but the control and goal directedness remain in the modern version of the word" (Oxford, 1990, p.8). The term 'strategy' has been defined differently by different researchers. In the context of language learning, the term 'strategy' refers to a specific kind of action to which the learners resort to improve their performance in learning and using a language (Naiman, et al., 1978). Ehrman and Oxford (1988) defined language learning strategies as "the often-conscious steps or behaviors that learners adopt to help them learn" (p. 311). By the same token, Scarcella and Oxford (1992), considered learning strategies as specific actions, steps, procedures, etc., taken by the learners to encourage them to tackle a difficult language learning task, the result of which is expected to lead to an improvement in learning. Almost at the heart of all definitions of strategies in our field lies the idea of consciousness and goal-directedness (Bialystok, 1985; Oxford, 1990). Oxford and Nyikos (1989) argued that since the power of consciously using L2 learning is not perceived by most of the students, skilled teachers can help their students to develop an awareness of learning strategies for making learning quicker and more effective.

According to Oxford (2003), language learning strategies are classified into six groups including cognitive, metacognitive, memory, compensation, affective, and social strategies. Cognitive strategies refer to mental processes for recalling information and using background knowledge to learn. Metacognitive strategies allow learners to cope with new rules, set goals, plan their learning, and evaluate the results which help them to monitor their own learning processes (Oxford, 2003). Memory strategies deal with grouping, pairing or making meaningful maps. Compensation strategies manifest themselves when the learners deal with their knowledge insufficiency or their missing knowledge and help students compensate by making guesses or inferring information from the context, for instance. Affective strategies regulate learners' motivation, enhance positive emotions, reduce stress and anxiety, increase self-encouragement and self-esteem, and also create a learner-friendly atmosphere. Finally, social strategies are used by learners to interact with other learners or to communicate with native speakers (Oxford, 2003).

Research on the domain of strategies began with "good language learner strategies" by Rubin (1975). From these initial efforts, the importance of language learning strategies has been emphasised by such experts in the field as Abraham and Van (1987), O'Malley, Chamot and Kupper (1989), Naiman et al. (1978), O'Malley and Chamot (1990), and Reiss (1981). They all noted that language learning strategies were employed more frequently and appropriately by successful learners. They believe that language learning strategies play a key role in foreign language learning because these strategies can be helpful in facilitating such learning stages as acquisition, retrieval, and use of information (Chang, Cheng & Nian, 2007).

Numerous studies have been conducted on language learning strategy use and its relationship with other variables. For one, Soodmand Afshar, Tofighi and Hamzavi (2016) investigated the relationship between emotional intelligence, learning styles, language learning strategy use, and L2 achievement of 138 Iranian English as a foreign language (EFL) learners. The results of the study revealed that there was no significant relationship between learning styles and L2 achievement; however, L2 achievement was significantly correlated with emotional intelligence as well as language learning strategy use. In a similar study, the relationship between the students' learning style, language learning strategy use, and their English language achievement was investigated by Soodmand Afshar, Sohrabi and Malek Mohammadi (2015). The results revealed a significant relationship between strategy use and English language achievement; however, no significant relationship was found between the learners' learning styles and their English language achievement. Moreover, strategy use was found to be stronger predictor of English language achievement.

Learning styles

Style is a valid psychological construct and a significant determinant of educational achievement (Sims, Veres & Shake, 1989). Interest in learning styles goes back to the time when Carl Jung proposed the theory of psychological types in 1920s (Sternberg &

Grigorenko, 1997). In the field of education, this concept has been recognised since the mid-1970s (Griffiths, 2012).

A learning style is not an ability *per se*, but rather a preferred way of using one's abilities (Sternberg, 1994). Learning style "refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them" (Pashler, McDaniel, Rohrer & Bjork, 2008, p. 105) which implies that "optional instruction requires diagnosing individuals' learning style and tailoring instruction accordingly" (Pashler et al., 2008, p. 105). Pashler et al. added that learning style assessments usually require respondents to nominate what mode of information presentation they like (e.g., speech vs. words vs. pictures) and what type of mental activity is most preferable to them (e.g., listening vs. analysis). The most widely used hypothesis about the instructional value of learning styles is the *meshing hypothesis* based on the premise that "instruction is best provided in a format that matches the preferences of the learners" (Pashler et al., 2008, p. 105).

Similarly, Dunn and Griggs (1990, p. 3) defined learning styles as "the biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others". Oxford (1989) argued that the concept of learning styles is used to capture different aspects of a person which, in nature, includes a combination of cognitive, affective, and behavioural factors. According to Felder and Brent (2005), learning styles are known as cognitive and affective characteristics as well as psychological behaviours that act as stable indicators of how learners comprehend, respond, and interact with a learning environment.

Learning styles and their relationship with other variables have also been investigated widely in foreign language learning. For one, Magdalena (2015), investigating the relationship between learning styles, learning behaviour and learning outcomes for Romanian students, found a statistically significant relationship between learning styles and academic performance of the participants.

A large number of studies has also been carried out on learning styles in Iranian context. For one, Tabatabaei and Mashayekhi (2013) explored the relationship between learning styles and L2 achievement of 131 Iranian EFL learners. The results showed a significant correlation between learning styles and L2 achievement of the participants. In addition, the participants were found to prefer visual, auditory, tactile, and the kinesthetic styles respectively. In the same vein, Rezaeinejad, Azizifar and Gowhary (2015) investigated learning styles among 3958 high school students and its relationship with educational achievement. According to the results, there was a positive significant relationship between students' learning styles and their educational achievement. In addition, visual learning style was found to be the most commonly preferred one by the EAP learners.

As regards gender differences in the use of language learning strategies and learning styles, many studies have been conducted including those of Anderson (1991), Bacon (1992), Mochizuki (1999), Teh, Embi, Yusoff & Mahamod (2009), and Naserieh and Anani Sarab (2013). Naserieh and Anani Sarab (2013) for instance, investigated the relationship between perceptual learning style preferences of Iranian graduate students and their age,

gender, discipline, and proficiency level. The findings of the study indicated that the participants preferred kinaesthetic, tactile and group learning styles. In addition, females were found to be more group-oriented, whereas males mostly tended to work individually.

English for academic purposes

Hutchinson and Waters (1987) divided ESP (English for specific purposes) into EAP and EOP/EVP (English for occupational/vocational purposes). The purpose of the learners in EAP, as a branch of ESP, is to learn English in order to become independent learners which is in line with the underlying principles of learning styles and strategies, especially the latter, the main purpose of which according to Oxford (1990) is to make learners autonomous and self-directed.

Many studies can be found in the field which have explored different learner variables including learners' preferred learning styles and strategies. However, a deeper investigation of the issue is deemed necessary because, to the best of the researchers' knowledge, despite the significance of learning styles and strategies, little research has been carried out in this regard in Iranian EAP context. In addition, among the various factors that are generally conceived to affect the use of language learning strategies and styles, gender has not gained enough research attention. Thus, to fill the research gap, the present study set out to investigate the relationship between learning strategies, learning styles, and L2 achievement of Iranian EAP students mediated by gender.

Drawing upon the points mentioned above regarding the significance of the current study, the following research questions were formulated:

1. Is there any significant relationship between language learning strategy use and L2 achievement of Iranian EAP learners?
2. Is there any significant relationship between learning styles and L2 achievement of Iranian EAP learners?
3. Is there any significant relationship between learning styles and language learning strategy use of Iranian EAP learners?
4. Between language learning strategy use and learning styles, which one is a stronger predictor of Iranian EAP learners' L2 achievement?
5. Among the components of language learning strategy use, which one is a stronger predictor of Iranian EAP learners' L2 achievement?
6. Among the components of learning styles, which one is a stronger predictor of Iranian EAP learners' L2 achievement?
7. Is there any significant difference between male and female Iranian EAP learners regarding their frequency of use of language learning strategies and adoption of different learning style types?

Method

Participants

The participants of the study included 120 Iranian EAP learners selected based on convenience sampling from among the EAP students in a university in Iran majoring in various fields of Humanities including political sciences, psychology, economics, and law. Out of this total number, 76 were female and 44 were male whose age ranged from 21 to 39.

Instruments

Two separate five-point Likert-scale questionnaires were adopted for data collection purposes in the study.

Strategy Inventory for Language Learning (SILL)

The first scale adopted was Oxford's (1990) *SILL* (version 7.0). It is a 50-item Likert-scale questionnaire including six components of cognitive, metacognitive, memory, social, compensation, and affective strategies. It appears that *SILL* is the most often adopted strategy use scale around the world, and the only language learning strategy instrument that has been checked for reliability and validity in multiple ways and in various contexts throughout the world including Iran. A copy of *SILL* can be found in Appendix 1.

Perceptual Learning Styles Preference Questionnaires (PLSPQ)

The second scale utilised in the present study was an adapted version of Reid's (1987) *PLSPQ*. *PLSPQ* originally contained 30 Likert-scale items ranging from 1 (=strongly disagree) to 5 (strongly agree). Karthigeyan and Nirmala (2013) adapted and validated, through expert judgment and pilot testing, Reid's original 30-item *PLSPQ* for the Indian context and reduced it to 25 items including the five components of visual, auditory, kinesthetic/tactile, group, and individual learning styles. According to Reid (1987), while *visual* learners learn basically with their eyes (e.g., through reading; see items 2, 7, 10, 12 and 24 of the adapted *PLSPQ* in Appendix 2), *auditory* learners learn best with their ears (i.e., they prefer listening to lectures or learning through hearing in the class; e.g. items 1, 6, 8, 16 and 20 of the adapted *PLSPQ* in Appendix 2). On the other hand, *kinesthetic or tactile* learners, to use Reid's words, learn through experience or what Reid (1987) calls "hands-on tasks" (i.e. they prefer learning by doing exercises and things, participating in role-plays and other classroom activities; e.g., items 3, 11, 15, 19, 25 of the adapted *PLSPQ* in Appendix 2). Some learners learn best when they are in groups with others (e.g., items 5, 9, 13, 18, and 22 of the adapted *PLSPQ* in Appendix 2) whereas others prefer to learn individually and work on their own (Reid, 1995) (see items 4, 14, 17, 21 and 23 of the adapted *PLSPQ* in Appendix 2). The Cronbach's alpha internal consistency reliability coefficient of this adapted *PLSPQ* was found to be 0.72 by Karthigeyan and Nirmala (2013) and 0.70 in the present study. Also, the validity of *PLSPQ* has already been established in various educational contexts throughout the world. A copy of the adapted *PLSPQ* can be found in Appendix 2.

Procedures

The data collection procedure took place in a university in Iran. At the outset of the study, the informed consent of the participants was obtained and the purpose of the study and the process of completing the questionnaires were briefly explained in Persian. The questionnaires were administered to the participants in two separate sessions, and one of the researchers was present at the time of administering them to resolve any possible ambiguities. The questionnaires were administered in Persian in June 2017, the completion requiring about 45 minutes. In addition, the participants' average scores in the English courses they had already taken at university were collected from the university and were regarded as a measure of their L2 achievement.

Data analysis

A Pearson product moment correlation was run to investigate the relationship among the variables of the study (i.e. to answer the first three questions). Moreover, to find out which independent variable (i.e. learning styles, or strategies) was a stronger predictor of the participants' L2 achievement, a multiple regression analysis was applied. In addition, two multiple regression analyses were conducted to answer questions five and six of the study. Also, two independent samples *t*-tests were conducted to compare Iranian male and female EAP learners in their frequency of use of language learning strategies and the type of learning styles they adopted.

Results

In order to answer the first three research questions of the study, three separate Pearson product moment correlations were run to investigate the relationship between the participants' learning styles and L2 achievement, and their strategy use and L2 achievement as well as their learning styles and strategy use. The results are presented in Table 1.

Table 1: Correlation between learning styles, learning strategy use and L2 achievement of Iranian EAP students

	L2 achievement	Learning styles	Strategy use	Sig. (2-tailed)	
L2 achievement	1	.312**	.293**	.001	.001
Learning styles	.312*	1	.276**	.001	.002
Strategy use	.293**	.276**	1	.001	.002

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

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

As Table 1 indicates, there was a statistically significant positive correlation between (a) EAP students' language learning strategy use and their L2 achievement ($r = .293$, $p < 0.05$); (b) EAP students' learning styles and their L2 achievement ($r = .312$, $p < 0.05$); and (c) EAP students' language learning strategy use and their learning styles ($r = .276$, $p < 0.05$).

The fourth research question examined, between learning styles and language learning strategies, which one was a significantly stronger predictor of the participants' L2 achievement. A multiple regression analysis was conducted, the results of which are summarised in Tables 2, 3 and 4. First, Table 2 shows the multiple correlation coefficient, and the adjusted and unadjusted correlation of learning styles and language learning strategies with L2 achievement.

Table 2: Model summary investigating the multiple correlation coefficients, the adjusted and unadjusted R of the variables

R	R square	Adjusted R square	Std. error of the estimate
.37a	.14	.12	1.89

a: Dependent variable: L2 achievement

As the results in Table 2 indicate, the multiple correlation coefficient (R), is .37 ($R^2 = .14$) and the adjusted R squared is .12. It indicates that 12% of the variance in participants' L2 achievement can be predicted from the combination of learning styles and language learning strategies.

In the next phase, to investigate whether the combination of the predictors (i.e. learning styles and language learning strategies) significantly predicted Iranian EAP students' L2 achievement, an ANOVA was run, the results of which are presented in Table 3.

Table 3: ANOVA results

	Sum of squares	df	Mean square	F	Sig.
Regression	70.16	2	35.08	11.96	.000b
Residual	418.74	117	3.57		
Total	488.90	119			

a: Dependent variable: L2 achievement

b: Predictors: (Constant), learning styles, learning strategy use

Table 3 shows the combination of learning styles and language learning strategies significantly predicted L2 achievement of the participants, $F = 11.96$, $p = .00 < .05$. Table 4 shows the amount of contribution of each of the independent variables (i.e. learning styles and language learning strategies) to the dependent one.

Table 4: The amount of contribution of learning styles and strategy use to L2 achievement

	B	Std. error	Beta	t	Sig.
(Constant)	-.08	3.73	-.02	0.98	
Learning styles	.09	.03	.25	2.80	.00
Learning strategy use	.05	.02	.22	2.51	.01

As indicated in Table 4, both learning styles and language learning strategies were significant predictors of the participants' L2 achievement; however, learning styles was found to be a stronger predictor ($Beta = .25$, $t = 2.80$, $p = .00 < .05$).

To answer the fifth research question, i.e. which component of language learning strategies significantly predicted L2 achievement, a multiple regression analysis was conducted, the results of which are summarised in Tables 5, 6 and 7.

Table 5: Model summary investigating the multiple correlation coefficients, the adjusted and unadjusted R of the variables

R	R square	Adjusted R square	Std. error of the estimate
.65a	.43	.40	1.56

a: Dependent variable: L2 achievement

As the results in Table 5 show, the multiple correlation coefficient (R) is .65 ($R^2 = .43$) and the adjusted R squared is .40. It indicates that 40% of the variance in participants' L2 achievement can be predicted from the combination of the six components of language learning strategies.

To investigate whether the combination of the predictors significantly predicted Iranian EAP learners' L2 achievement, an ANOVA was run, the results of which are presented in Table 6.

Table 6: ANOVA results

	Sum of squares	df	Mean square	F	Sig.
Regression	210.64	6	35.10	14.25	.000
Residual	278.25	113	2.46		b
Total	488.90	119			

b: Predictors: (Constant), learning styles, learning strategy use

As it can be seen in Table 6, the combination of various components of language learning strategies predicted L2 achievement of the participants, $F = 14.25$, $p = .00 < .05$.

Table 7: The amount of contribution of each of the components of language learning strategies to the L2 achievement

	B	Std. error	Beta	t	Sig.
(Constant)	-1.08	2.03		-.53	.59
Memory	.13	.05	.20	2.50	.01
Cognitive	.23	.03	.44	5.98	.00
Compensation	-.08	.04	-.16	-1.99	.04
Metacognitive	.09	.04	.17	2.20	.02
Affective	.10	.05	.16	2.14	.03
Social	.12	.04	.21	2.52	.01

As the results in Table 7 indicate, all the components of the language learning strategies were significant predictors of the participants' L2 achievement; however, the cognitive language learning strategy group was a stronger predictor ($\beta = .44$, $t = 5.98$, $p = .00 < .05$).

Another multiple regression analysis was conducted to answer the sixth research question, which investigated which one of the different types of learning styles was a stronger predictor of L2 achievement. Table 8 shows the multiple correlation co-efficient, and the adjusted and unadjusted correlation of five different types of learning styles with L2 achievement.

Table 8: Model summary investigating the multiple correlation coefficients, the adjusted and unadjusted R of the variables

R	R square	Adjusted R square	Std. error of the estimate
.75a	.57	.55	1.35

a: Dependent variable: L2 achievement

As indicated in Table 8, the multiple correlation coefficient (R), is .75, ($R^2 = .57$) and the adjusted R squared is .55. It indicates that 55% of the variance in the participants' L2 achievement can be predicted from the combination of the five different types of learning styles. Also, an ANOVA was run to investigate whether the combination of the predictors significantly predicted Iranian EAP learners' L2 achievement. The results are summarised in Table 9.

Table 9: ANOVA investigating the prediction of the different types of learning styles for L2 achievement

	Sum of squares	df	Mean square	F	Sig.
Regression	280.17	5	56.03	30.60	.000b
Residual	208.73	114	1.83		
Total	488.90	119			

b: Predictors: (Constant), learning styles, learning strategy use

As indicated in Table 9, the combination of various types of learning style components predicted L2 achievement of the participants, $F = 30.60$, $p = .00 < .05$.

Table 10: The contribution of various types of learning styles to L2 achievement

	B	Std. error	Beta	t	Sig.
(Constant)	4.91	1.09		4.50	.00
Visual	.34	.04	.53	7.66	.00
Auditory	.15	.04	.21	3.43	.00
Kinesthetic/tactile	.04	.04	.07	1.21	.22
Group	.12	.04	.19	2.98	.00
Individual	.08	.04	.11	1.80	.07

As shown in Table 10, among various types of learning styles, visual, auditory, and group were significant predictors of participants' L2 achievement; however, visual learning style was a stronger predictor (Beta = .53, $t = 7.66$, $p = .00 < .05$).

Research question 7 investigated the difference between Iranian male and female EAP learners with regard to the frequency of use of language learning strategies and the type of learning styles they adopted. To this end, two separate independent samples t -tests were conducted, the results of which are summarised in Appendices 3 and 4 respectively. The most significantly frequently used strategy group by female learners was cognitive strategies ($M = 37.99$, $SD = 3.08$), while male learners used metacognitive strategies more frequently than their female counterparts ($M = 42.09$, $SD = 3.60$). The type of learning style significantly preferred by female learners was group learning style ($M = 17.83$, $SD = 3.22$), while male learners significantly preferred the use of visual learning style ($M = 17.73$, $SD = 2.51$).

Discussion

As Allebone and Davies (2000) maintained, many different factors affect learning, including learning styles, prior knowledge about the subject, attitude and knowledge about learning as well as learning strategy use. Therefore, a study focusing on both language learning strategies and learning styles might prove fruitful for both students and teachers, as well as educational policy makers.

The first research question of the study investigated the relationship between language learning strategy use and L2 achievement of Iranian EAP learners. The results demonstrated a statistically significant positive correlation between the two variables. More support for this finding comes from the works of such researchers as Abraham and Van (1987), O'Malley, Chamot and Kupper (1989), Naiman et al. (1978), O'Malley and Chamot (1990), and Reiss (1981) who all emphasised the important role of language learning strategies in learning outcomes. It can thus be implied that if teachers intend to improve their students' L2 achievement, they should encourage their students to use more language learning strategies, especially those strategies that have been found in the present study and other similar studies as effective contributors to success in L2 learning.

The second research question explored the relationship between learning styles and L2 achievement of Iranian EAP learners. The results indicated that there was a significant positive correlation between the two variables. These results are in sharp contrast with the findings of Soodmand Afshar, Sohrabi and Malek Mohammadi (2015), who found no significant relationship between the learners' learning styles and their English language achievement. The findings are, however, in line with Magdalena (2015) who investigating the relationship between learning styles, learning behaviour and learning outcomes for Romanian students, found a statistically significant relationship between learning styles and academic performance of the participants. Similarly, the studies by Tabatabaei and Mashayekhi (2013) and Rezaeinejad, Azizifar and Gowhary (2015) on the relationship between learning styles and L2 achievement also found a significant correlation between

these two variables. Teachers thus need to be made aware of the students' existing learning styles, to encourage the development and adoption of a balanced learning style in their classrooms. However, it might be difficult to take all the learners' learning style preferences into account in the real EAP context, due to practical issues such as the size of the EAP classes, high individual differences and preferences, etc.

The third research question examined the relationship between Iranian EAP learners' learning styles and their language learning strategies. Results showed a significant positive correlation between the two variables, a finding which is partially in line with the results of Soodmand Afshar, Tofighi and Hamzavi (2016) on the relationships between emotional intelligence, learning styles, language learning strategy use, and L2 achievement of Iranian EFL learners.

In the past two decades, the findings of both qualitative and quantitative studies on language learning strategies all pinpoint the influential factors affecting learning strategy choice and use as including learning styles (Ma & Oxford, 2014; Wong & Nunan, 2011), personality types (Chen & Hung, 2012), and learning context (Norton & Toohey, 2001; Raymond & Parks, 2002). Providing more support to this notion, Cohen (2003) argued that depending on the nature of a specific learning task, learners' choices of strategies may be influenced by their learning styles. It might thus be inferred that learning strategies, styles, and tasks are three elements of crucial importance forming a strong chain in the given learning context. Corroborating this stance, Dornyei (2009) maintained that learning strategies are the composed product of learning styles, motivation, and task.

The fourth research question investigated the predictor variables of the study, i.e. learning styles and language learning strategy use, to understand which one was a stronger predictor of Iranian EAP learners' L2 achievement. Based on the results, both learning styles and language learning strategy use were significant predictors of learners' L2 achievement. However, learning styles was found to be a stronger predictor of L2 achievement. The strongest support for this finding might come from the meshing hypothesis which, as already mentioned, maintains that instruction is the most beneficial when it most suits the learners' preferences.

In contrast to our results which found learning styles to be a stronger predictor of L2 achievement, Soodmand Afshar, Sohrabi and Malek Mohammadi (2015) found strategy use to be a stronger predictor of English language achievement. This might highlight the fact that more research is needed to be conducted on the topic to resolve the contradictions observed in similar learning contexts.

The fifth research question of the study sought to identify from among the components of language learning strategy use, which one was a stronger predictor of L2 achievement by Iranian EAP learners. The results indicated that all components of language learning strategies were significant predictors of the participants' L2 achievement; however, the cognitive learning strategy group was found to be a stronger predictor. This finding is supported by Clarke (2008, p. 35), who maintained that "almost all cognitive approaches to learning are concerned with how everyday experiences are transformed or processed

into mental images or sounds and stored for later use”, which shows the crucial role cognition plays in learning. In line with this reasoning, Protheroe (2003) maintained that cognitive strategies are general methods of thinking that can improve learning across various subject areas. The finding of our study in this respect can also be justified in the light of Oxford’s (1990) assertion that cognitive strategies are related to the brain processes which can help learners select the relevant information and reject the unnecessary materials. That is, perhaps, why education has long tried to strengthen the cognitive skills involved in the acquisition of a foreign language.

The sixth research question of the study sought to identify from among different types of learning styles, which one was a stronger predictor of L2 achievement of Iranian EAP learners. The results revealed that among the components of learning styles, visual, auditory, and group learning styles were significant predictors of the participants’ L2 achievement; however, visual learning style was found to be a stronger predictor of the participants’ L2 achievement than the others. This finding is partially in line with those of Pepe and Kozan (2013) who, investigating language learning styles of college students in different departments, indicated that students learned better by reading, talking, listening, and writing, especially through visual items. More support for this notion comes from the studies conducted by Tabatabaei and Mashayekhi (2013) and Rezaeinejad, Azizifar and Gowhary (2015), who also found the visual learning style to be students’ most commonly used style type.

The seventh research question investigated the difference between Iranian male and female EAP learners with regard to the frequency of use of language learning strategies and the type of learning styles they adopted. The cognitive and metacognitive strategies were found to be the most frequently used strategy groups by female and male learners respectively. These results here stand in sharp contrast with the findings of Salahshour, Sharifi and Salahshour (2012), who found the cognitive strategies and metacognitive strategies to be the most frequently used strategy groups by male and female participants respectively. In addition, the most preferred learning style type by female learners was found in the present study to be group learning style, while male learners significantly preferred the use of visual learning style. Corroborating our findings in this respect, Naserieh and Anani Sarab (2013) also found the females to be more group-oriented, and the males more individual-oriented.

According to Reid (1998), students who prefer the visual learning style “learn well from seeing words in books, on the chalkboard, and in workbooks. Students can remember and understand information and instructions better if their teachers read them” (p. 165). Moreover, students who prefer the group learning style learn best when “they are studying in a group or at least with another student. Students value group interaction and class work with other students and can remember information better when they work with two or three classmates” (Reid, 1998, p.166) which can help them gain more motivation towards, interest in and attention to learning.

Conclusion

To sum up, it could be argued that if language learners become more aware of language learning styles and strategies, they will be more successful. Also, it can be concluded that use of appropriate language learning strategies and learning styles would lead to improved L2 achievement. The results of the current study might provide some information on the type of learning styles and strategies students prefer, which need to be focused upon in foreign language learning and teaching. Thus, it is important for EAP teachers to raise their students' awareness of various learning styles and strategies, and make them autonomous in choosing those which best suit them, because, as Oxford (1990, p.11) mentions, "when students take more responsibility, more learning occurs, and both teachers and learners feel more successful". This enables the EAP teachers to follow helpful styles and strategies to improve the abilities and attitudes of their students, which might make learning more enjoyable, easier, quicker, more effective and more learner-centred.

Moreover, we suggest that English language education policy makers present programs that help EAP teachers become familiar with suitable learning strategies and styles, and help them to encourage their students to adopt various learning strategies and styles more likely to lead to successful learning. Similarly, syllabus designers and material developers need to design textbooks and materials which highlight language learning strategies and learning styles, either explicitly or implicitly, as significant factors in promoting L2 achievement, is also maintained and corroborated by the tenets of social constructivism and its pedagogical paradigms. As rightly highlighted by Miller (2002), teachers' pedagogical paradigms and instructional theorisations basically define their teaching and instruction. According to Miller (2002), educators "who come from a constructivist paradigm will naturally use multiple instructional strategies to promote student construction of knowledge and thus enhance the learning of all students" (p. 4).

Some further points are worth mentioning from the results of the present study. Replicating this study among different sociocultural groups seems critical in order to be able to generalise the findings more widely. The identification of the possible impact of language learning strategy training on the development of EAP students' L2 achievement is deemed essential. Further research is also needed to identify the role of EAP teachers' knowledge of language learning strategies and learning styles in their use of these variables, as such knowledge can help them project a more personalised, sensitive, and more supportive attitude towards their EAP students' L2 achievement. Last but not least, since the two variables of the present study (i.e., language learning strategies and learning styles) were assessed merely through questionnaires, future research could replicate this study with adoption of some qualitative methods (e.g., interviews, reflective journals, introspective and retrospective think-aloud procedures, etc.), to enhance the generalisability and dependability of the findings and interpretations.

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Appendix 1: Oxford's (1990) Strategy Inventory for Language Learning (SILL)

	Item	1	2	3	4	5
1	I think of relationship between what I already know and new things I learn in English					
2	I use new English words in a sentence so I can remember them.					
3	I connect the sound of a new English word and an image or picture of the word to help me remember the word.					
4	I remember a new English word by making a mental picture of a situation in which the word might be used.					
5	I use rhymes to remember new English words.					
6	I use flashcards to remember new English words					
7	I physically act out new English words.					
8	I review English lessons often.					
9	I remember new English words or phrases by remembering their location on the page, on the board, or on a street sign.					
10	I say or write new English words several times					
11	I try to walk like native English speakers.					
12	I practice the sounds of English.					
13	I use the English words I know in different ways.					
14	I start conversations in English.					
15	I watch English language TV shows spoken in English or go to movies spoken in English					
16	I read for pleasure in English.					
17	I write notes, messages, letters or reports in English.					
18	I first skim an English passage (read over the passage quickly) then go back and read carefully.					
19	I look for words in my own language that are similar to new words in English.					
20	I try to find patterns in English.					
21	I find the meaning of an English word by dividing it into parts that I understand.					
22	I try not to translate word-for-word.					
23	I make summaries of information that I hear or read in English.					
24	To understand unfamiliar English words, I make guesses.					
25	When I can't think of a word during a conversation in English, I use gestures.					
26	I make up new words if I do not know the right ones in English.					
27	I read English without looking up every new word.					

28	I try to guess what the other person will say next in English.					
29	If I can't think of an English word, I use a word or phrase that means the same thing.					
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.					
39	I try to relax whenever I feel afraid of using English.					
40	I encourage myself to speak English even when I am afraid of making a mistake.					
41	I give myself a reward or treat when I do well I English.					
42	I notice if I am tense or nervous when I am studying or using English.					
43	I write down my feelings in a language-learning diary.					
44	I talk to someone else about how I feel when I am learning English.					
45	If I do not understand something in English, I ask the other person to slow down or say it again.					
46	I ask English speakers to correct me when I talk.					
47	I practice English with other students.					
48	I ask for help from English speakers.					
49	I ask questions in English.					
50	I try to learn about the culture of English speakers					

Appendix 2: An adapted version of Reid's 1987 PLSPQ

	Questionnaire statements	Strongly disagree 1	Dis-agree 2	Unde-cided 3	Agree 4	Strongly agree 5
1	I am used to reading aloud when reading the text.					
2	I learn better by reading what the teacher writes on the blackboard.					
3	I prefer learning by doing exercises and drills in the class.					
4	I prefer to learn individually.					
5	I prefer to work with my classmates.					
6	I prefer listening to lectures than reading textbooks.					
7	When I read instructions, I remember them better.					
8	I remember the things that I hear in class better than what I read.					
9	I learn more when I study with a group.					

10	I understand better when I read instructions.					
11	When I do things in class, I learn better.					
12	When learning a new skill, I prefer watching someone's demonstration than listening.					
13	I study better when I study with others in class.					
14	When I work alone, I learn better.					
15	I benefit more from involving hands on activities than hearing lectures.					
16	I learn better in the class when the teacher gives a lecture.					
17	I do my work better when I work myself alone.					
18	I enjoy doing an assignment with two or three classmates					
19	I understand things better in class when I participate in role-playing.					
20	I learn better when I listen to others in class.					
21	I prefer working on task by myself.					
22	I prefer to study with my friends in group.					
23	When I study alone, I understand well.					
24	I learn better by reading textbooks than listening to someone.					
25	I learn best in class when I participate in related activities.					

Appendix 3: Independent samples t-test results showing the difference between males and females in strategy use

Variables	Female		Male		t	Sig. (2-tailed)
	Mean	S.D.	Mean	S.D.		
Memory	24.05	2.62	24.27	3.59	.38	.00
Cognitive	37.99	3.08	25.64	4.50	3.59	.00
Compensation	16.63	3.63	16.05	4.17	.80	.01
Metacognitive	25.50	3.45	42.09	3.60	3.18	.04
Affective	16.08	2.52	17.14	3.75	1.84	.02
Social	16.70	3.37	18.57	3.52	2.87	.00

Appendix 4: Independent Samples t-test results showing the difference between males and females in learning styles

Variables	Female		Male		t	Sig. (2-tailed)
	Mean	S.D.	Mean	S.D.		
Visual	14.63	2.82	17.73	2.51	6.01	.00
Auditory	14.01	2.83	15.48	2.95	2.68	.00
Kinesthetic	13.54	2.84	15.14	3.35	0.49	.00
Group	17.83	3.22	14.89	3.19	2.38	.00
Individual	13.97	2.99	14.84	2.26	1.66	.02

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