

Investigating the Most Influential Learning Style Contributing to Test Performance and Strategy Use of Iranian EFL Learners in Reading Skill

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Abstract

This experimental study considered the effects of learning style variations on EFL learners' performance in different question types of the reading skill and their strategies to get higher scores. To achieve such goals, ninety learners with different academic backgrounds from IELTS classes of Shukuh English Language Institute in Tehran, participated in this study. The researcher first utilized two questionnaires with regard to learning styles and strategy uses. According to the Kolb's questionnaire it is believed that learners have Activist, Theorist, Pragmatist and Reflector learning styles. A majority of candidates were recognized as Reflector but activist candidates had a better performance in IELTS and also for strategy use. In considering learning style variation according to the results of the one-way analysis of variance, we were on the safe side to say that variation due to belonging to different style groups causes variation of performance for Yes, No, not given questions in reading skill. The most favorable learning strategy of the activist learners, who were the most successful students according to their band scores, was making summaries which had not only the highest frequency, but also the highest weighted sum.

Keywords: learning style variations, learning strategies, activist

Introduction

Learning style has been defined by various scholars mostly as a signal for individual differences. Kolb (1980) defines learning styles as flexibly stable learning preferences. The theoretical framework in this study is formed out of Kolb's theory of learning style. According to Kolb (1984), psychological attributes, resulted from individual differences, determine the particular strategies a person chooses while learning. Kolb classified learners' learning styles as theorists, reflectors, activists, and pragmatists. People who are classified as activists put themselves completely and without doubt in new experiences and enjoy the here and now and are satisfied to be dominated by immediate experiences. Reflectors collect data, both first hand and from others, and prefer to consider it thoroughly before concluding. Theorists adapt and integrate observations into complex but logically sound theories. Pragmatists are eager to try out ideas, theories and techniques to determine whether they are practical or not. Kolb (1984) and Honey and Mumford (1992) defined learning style as an individual's preferred or habitual ways of processing and transforming knowledge. Brown (2005) believed that one of the most important individual differences that attracted attention in recent years is learning style variation that causes

diversity both in learning and in test performance. This claim of Brown (2005) was the eye-opener idea for the present study.

Pawlack (2009) considered factors such as learning styles and learning strategies externally manipulated cognitive factors. Cohen (2010) saw learning styles as characteristics that can be made during the process of second or foreign language learning. As it was already mentioned learning style is generally classified by scholars as an enduring factor of individual learner differences (Cassidy, 2004).

Today, thanks to increasing interest in learning languages, there is a greater recognition of our need to gain a deeper understanding of our students, their learning differences, learning styles, learning difficulties and their predisposition to certain types of tasks to achieve their goals successfully (Abdul Nasir, 2009). Thus the main aim of the present study based on what is said above was to shed a new light on the influence of individual differences in terms of learning styles on the performance of learners in different question types of the reading section of IELTS examination. The study also examined to what extent variation due to differences of learning styles leads to Iranian IELTS candidates success in IELTS examination. The present study at the end tried to determine the most frequent language learning strategies of the most successful learners based on learning style variation. Therefore, the present study sought to address the following research questions.

Q1: What is the most frequent learning style preference (according to Kolb's theory) among Iranian EFL learners?

Q2: Is there any significant difference between individual learning style and test performance of Iranian candidates in IELTS?

Q3: Do the EFL learners' learning style variations have a significant impact on performance in different question types of reading examination?

Q4: Do the EFL learners' learning style variations have a significant impact on strategies which are used by the most successful learners?

Review of literature

The birth of learning style

Successful transmission of information and skills to learners was the only aim of education in general and language instruction in particular in the past. It was believed that teachers knew what the students needed to learn; it was also assumed that learners need an adequate level of motivation to learn (Polat, 2015). However, back near the beginning of the 1970s, researchers found out that learners participate actively in the process of language learning (Shen, 2010). In the light of this observation interest in the concept of learners' differences and how these differences affect language learning process came into existence (Moradkhan and Mirtaheri, 2013). The beliefs that were questioned in the 1970s paved the way to propose other hypothesis to describe the language learning process. Scholars in the 1970s claimed that learners may approach the learning process differently depending on their preferences and their styles. (Levin et al.1974 cited in Larsen-Freeman & Long 1991) .The result of the present study also confirmed such claims. The result of such studies led to the concept of learner differences and the concept of learner differences led to the birth of the term learning style (Moradkhan and Mirtaheri, 2013).

Related studies at home and abroad

In second and foreign language learning the individual learning style plays an important role (Carrell and Prince, 1996; Ehrman, 1995; Gardner et al., 1997).Many research studies have

shown the relationship between learning style and academic achievement (Shen, 2010). Matthews (1996) showed that learners with different learning styles differ in their academic performance and certain styles may be more influential than other styles for particular activities in education. In terms of the relationship between learning style variation and using strategies, Grossmann (2011) concluded that there exists a link between cognitive styles and using strategies and he showed that certain types of strategies were more important for successful learning for different cognitive style groups. The reviewed studies showed that there is a relationship between personality types and traits of the learners, the way they form their learning styles, and their academic success in school and university in undergraduate and postgraduate programs (Shen 2010). Therefore based on the type of their personality, learners inclined to different learning styles or preferences which in turn affect their learning performance. However, there exist limited studies either theoretical or empirical investigating exclusively the role of personality and learning styles on IELTS performance, also there exists scarce literature related to studies that have considered learning style variations or preferences contributing to success in test performance, and the existing literature mostly investigates the effect of cognitive and metacognitive styles or perceptual preferences on learners' performance, and mainly, compares different styles two by two. In Iran, researchers mostly have centered attention on different cognitive styles and their influence on test takers performance. Khodadady and Zeynali (2012) considered the relationship of being field-dependent and field-independent and listening comprehension ability of IELTS candidates. The results showed that Field-dependency cognitive styles, however, correlates more significantly with multiple choice and matching questions compared to field-independency cognitive style.

In summary, research from the above-reviewed literature has drawn our attention to cognitive, perceptual and personal elements that affect learning, test performance, and strategy use of learners. This study finally, is driven by the interest of researchers to identify the influence of learning style variation and tries to shed a new light on the role that learning styles might play in test performance and strategy use of successful learners. The results of the present study are in harmony with the theories of Grossmann (2011) who sees a link between learning styles and using strategies and also theories of Matthews (1996) who showed that learners with learning styles variation differ in their educational performance and certain styles may be more influential than other styles for specific activities in education.

Method

Participants

To conduct the study, 90 Iranian IELTS candidates from Shukuh English Language Institute central branch in Tehran, took part in the study and the sampling method was based on availability. Moreover, the sample consisted of both male and female learners, and they mostly aged between 20 to 27 years old. The participants of the study comprised 35 males and 55 females and all were university students or graduated from BA and MA programs in different majors of humanities, technical sciences, medicine and, nursing. Mostly their purpose of participating in IELTS courses was taking IELTS exam as a secure, valid and reliable indicator of true-to-life ability for academic and general purposes to facilitate their endeavor to communicate in English for education, immigration, and professional accreditation in future.

Instruments

In order to find answers to research questions, the researcher first utilized learning style questionnaire which originally was constructed by Kolb (1999) and later was shortened by Honey

and Mumford (2006) for the purpose of being simplified for use in a practical training situation. The questionnaire has 80 items and is designed to find out learners' preferred learning styles. In order to measure learning strategies a self-report questionnaire was used (language strategy use inventory and index by Cohen and Chi 2002). The adapted version of Language Strategy Use Questionnaire consists of 40 bilingual statements concerning the four major English language skills, namely listening, speaking, reading and writing. There are ten statements for each language skill. This instrument has a strong reliability level as the Cronbach alpha coefficient is 0.91 (Yoong 2010). Both questionnaires were written in English but translation was provided for students in separated sheets. Besides the questionnaires, other instruments of the study were the reading section of the IELTS from Cambridge IELTS7 (2009). The reading test consisted of three sections. In reading section, a variety of tasks were applied like form-completion, note-completion, fill-in-the-gap questions and sentence completion tasks, also multiple choice and matching questions were involved in reading section.

It is worth mentioning that for the purpose of making sure that all IELTS participants had the equal command of English knowledge, The English Language Proficiency Test (ELPT) had already been given to candidates as a placement test and the results were analyzed by the researcher showing a normal curve. The descriptive statistics will be discussed later in this article.

Procedures

According to language learning style questionnaires individuals were divided into four categories of activists, reflectors, theorists and pragmatists. The data collected from the participants was analyzed using the Statistical Package for Social Sciences (SPSS version 20). Descriptive statistics such as mean, percentage and frequency were utilized to numerically analyze the perceptions of students concerning to what extent variation due to differences of different learning styles leads to Iranian IELTS candidates higher band scores. And also to analyze to what extent variation of performance on different question types depends on learning styles.

In order to compare the mean of band scores of these four groups, one-way analysis of variance was used and to find out which groups are significantly different from one another, the researcher conducted post-hoc comparisons. In order to consider the performance of different learning style groups in different reading tasks of the IELTS, again one-way analysis of variance was used. To determine the frequency of language learning strategies an interpretation mean score was employed. Students' responses were categorized into three classes, which are high, moderate, and low frequency use of language strategy.

Administration of questionnaires

The first step in the actual study was the administration of the student-version of the Kolb's questionnaire. The students responded to 80 items designed to find out learners' preferred learning styles by choosing the statements which matched their learning styles the best. This questionnaire also helped to pinpoint learning preferences so that learners were in a better position to select learning experiences that suit their styles. There was no time limit for completing this questionnaire. There were no right or wrong answers and the reliability of the questionnaire was calculated based on Cronbach Alpha. In the present study, it was 0.81 which indicated a good level of conceptual relatedness among items. In the second phase of the administration of the study, the adopted version of language strategy use questionnaire (Cohen and Chi 2002) was used. A 5 point Likert scale ranging from 1 to 5 is used in this questionnaire.

Students are required to mark each strategy according to the frequency of the strategy used to help them master the English language. The 5 point Likert scale is as follows.

1= never true of me, 2= usually not true of me, 3=sometimes true of me, 4=usually true of me, and 5=always true of me. To determine the frequency of language learning strategy use, an interpretation mean score was employed. Students' responses were categorized into three categories, which are high, moderate and low frequency use of language strategy

Results

Data analysis

The data collected by means of learning style questionnaire formed the independent variable of belonging to a specific style. Internal consistency reliability of the questionnaire is established by calculating Cronbach's alpha and as Table 1 shows it can be regarded as highly satisfactory.

Table 1. Reliability Statistics

Cronbach's alpha	Cronbach's alpha based on standardized items	No of items
0.811	0.812	80

In this case $\alpha=0.81$ which shows the questionnaire is reliable.

Descriptive statistics for the first research question

In order to answer the first research question regarding the overall learning style preferences among Iranian EFL learners, the researcher calculated the descriptive statistics such as frequency and percentage. Table 2 illustrates the results.

Table 2. Frequency of different learning styles

Style	frequency	percent	valid percent
Activist	15	16.67	16.7
Reflector	40	44.44	44.40
Theorist	12	13.33	13.3
Pragmatist	23	25.56	25.6
Total	90	100	100

As it is demonstrated in Table 2, a majority of candidates (44.44 %, 40 candidates) were recognized as Reflector while 25.56 % of them (23 candidates) had Pragmatist learning style. Moreover, 16.67 % of candidates (15 candidates) enjoyed Activist learning style and Theorist had the least frequent learning style among Iranian candidates of IELTS in this study (13.33 %, 12 candidates).

Descriptive statistics of IELTS sample test

We had four groups of candidates of different learning styles. Table 3 summarizes the descriptive statistics for their IELTS examination.

Table 3. Basic descriptive statistics for the IELTS examination of learning groups

Style	N	Mean	SD	Std mean
Activist	15	6.167	.66542	.22181
Reflector	40	5.425	.45154	.19874
Theorists	12	5.75	.51844	.21454
Pragmatics	23	5.304	.42141	.19451

ANOVA results for IELTS test

The second research question of this study tried to check if there was any significant difference between individual learning style and IELTS performance of candidates. To achieve this goal, the group statistics was first obtained for each group and also for the IELTS performance. Following that, the One-Way ANOVA was run to analyze and compare the mean scores among the four groups of learning styles. As stated to find out whether the differences in the mean scores of the four groups were significant or not, the one way analysis of variance was conducted and according to the results, all of the mean differences between groups were statistically significant. In fact, the mean score of the ACTIVIST group was significantly higher than the other groups' mean scores and this learning style group outperformed the others.

Table 4. ANOVA results on IELTS test

	Sum squares	Df	Mean square	F	Sig
Between groups	19.314	3	.634	4.200	.015
Within groups	94.124	86	.528		
Total	113.438	89			

As Table 4 shows, the significance is 0.015. This is smaller than $p = .05$, so the differences between the groups are statistically significant.

Scheffe test on IELTS scores

As it was already mentioned the candidates of different learning style groups differ in the amount of English proficiency, because they had different means of IELTS band scores. But we do not know exactly which groups are different from each other. This can be achieved by studying Table 5. Only the relevant information is presented. The styles are compared two by two. Where the difference between means is significant, the computer adds an asterisk.

Table 5. Scheffe test on IELTS scores

Learning style	Learning style	Mean difference	Sig
Activist	Reflector	0.742	.041*
Activist	Theorists	0.417	.121
Activist	Pragmatics	0.863	.023*

Reflector	Theorists	-0.325	.137
Reflector	Pragmatics	0.121	.421
Theorists	Pragmatics	0.446	.109

On Table 5 the significant differences are bold typed. The difference between activists and reflectors and also the difference between activists and pragmatics learning styles are significant (at $p=0.05$). The difference between reflectors and theorists as it is clear from the Table is negative. It means that theorist had a better mean score but the difference was not statistically significant at $p=0.05$.

Effect size

The effect size in one-way ANOVA can be calculated from the information provided in Table 4. We can use the following formula. $\text{Eta squared} = \frac{\text{sum of squares between groups}}{\text{sum of squares total}}$ that equals 0.17. As you can see we have a large effect size.

Reading comprehension data analysis

In order to consider the effect of belonging to different learning style groups on the learners' performance in different question types of the reading module of IELTS examination the mean scores of the four groups in different tasks was calculated and the result is summarized in Table 6.

Table 6. Basic statistics of learning style groups' reading tasks scores

Reading Tasks	Learning Style Groups	N	Mean	Std. Deviation	Std. Error of Mean
Matching Tasks	P	23	5.04	.7842	.2215
	A	15	5.68	.6484	.1987
	R	40	5.51	.6428	.2584
	T	12	5.93	.6481	.2365
Task Completion	P	23	5.29	.6384	.3254
	A	15	5.60	.7014	.2145
	R	40	5.69	.6415	.2158
	T	12	4.63	.6982	.3658
Yes, No, Not given	P	23	5.80	.6345	.2158
	A	15	7.04	.6122	.2195
	R	40	4.87	.5321	.2358
	T	12	4.93	.3941	.2987
Multiple Choice	P	23	5.37	.4322	.2984
	A	15	5.60	.4219	.2734
	R	40	5.36	.6641	.2648
	T	12	5.86	.5641	.2642
Short Answers	P	23	5.91	.6412	.2547
	A	15	5.83	.5411	.2674
	R	40	5.75	.7412	.2357
	T	12	5.43	.6214	.2351

To find out whether these differences in the mean scores of four groups were significant or not, again the one-way analysis of variance was conducted and the results are summarized in Tables 7 to 12.

Table 7. Mean difference of matching tasks among the four groups

	Sum of Squares	Df	Mean square	F	Sig
Between groups	.603	3	.201	.355	.786
Within groups	48.633	86	.565		
Total	49.235	89			

The difference is not statistically significant because $0.786 > p=0.05$

Table 8. Mean difference of task completion among the four groups

	Sum of Squares	Df	Mean square	F	Sig
Between groups	4.617	3	1.539	1.877	.139
Within groups	70.508	86	.820		
Total	75.125	89			

The difference is not statistically significant because $0.139 > p=0.05$

Table 9. Mean difference of yes, no, not given tasks among the four groups

	Sum of Squares	Df	Mean square	F	Sig
Between groups	32.421	3	10.807	6.731	.000
Within groups	138.069	86	1.605		
Total	170.490	89			

Table 10. Mean difference of multiple choices task among the four groups

	Sum of Squares	Df	Mean square	F	Sig
Between groups	3.327	3	1.109	1.505	.219
Within groups	63.387	86	.737		
Total	66.715	89			

The difference is not statistically significant

Table 11. Mean difference of short answers tasks among the four groups

	Sum of Squares	df	Mean square	F	Sig
Between groups	4.979	3	1.660	2.180	.096
Within groups	65.458	86	.761		
Total	70.436	89			

The difference is not statistically significant

In considering learning style variation according to the results of the one-way analysis of variance all of the mean differences between groups were not statistically significant ($p < 0.05$) except for Yes, No, not given questions. So we are on the safe side to say that variation due to belonging to different style groups causes variation of performance for Yes, No, not given questions. As it can be found from Tables 7-11, the results of the comparison between performances of the four groups in the IELTS reading test revealed that the theorist group was higher in matching tasks and multiple choice questions and reflectors outperformed the others in task completion questions while activists had better performance in yes, no not given tasks and pragmatics were better performers of short answer questions. So we were on the safe side to say that in different types of questions in reading comprehension module of the IELTS examination, variation due to belonging to different learning styles groups causes variation of performance in different question types.

Learning style group and variation of strategy use

As stated before to determine the frequency of language learning strategies which were used in the performance of individuals in the study, an interpretation mean score was employed. Candidates' responses were categorized into three categories, which are high, moderate, and low that showed the frequency use of language strategies. Table 12 shows the frequency ratings for strategy use.

Table 12. *Frequency rating for strategy use*

Frequency of Use	Responses	Mean Scores
High	Always true of me	4.5 – 5.0
	Usually true of me	3.5 - 4.4
Moderate	Sometimes true of me	2.5 - 3.4
	Usually not true of me	1.5 - 2.4
Low	Never true of me	1.0 – 1.4

Level of Strategy Use according to learning Styles

Table 13 shows the overall language learning strategy use of students. According to their learning styles activists and reflectors groups are high frequency users of reading strategies.

Table 13. *Level of strategy use according to learning style*

Skill		P	A	R	T
Reading	Mean	3.47	3.68	3.65	3.48
	Frequency	Moderate	High	High	Moderate
	Rank	1	1	1	1

The most frequent strategies of successful learners

As it was repeatedly mentioned in the study, candidates belonging to learning style activist, were the most successful in both gaining higher band scores and frequency of strategy use. In this part we investigate the most frequent strategies that these candidates have used. The study in this part is going to specifically answer the question of what strategies are used the most and the least frequently by successful IELTS candidates.

Table 14. *Statistics for activist participants' use of reading strategies*

No.	Item	Frequency of Rating					% of most frequent	Weighted Sum
		Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Always (5)		
1	Guess the meaning by using clues from context	0	4	2	4	5	33.5%	55
2	Make predictions	0	4	3	3	5	33.5%	54
3	Make summaries	0	3	2	4	6	40%	58
4	Pay attention to headings and subheadings	1	4	2	3	5	33.5%	52
5	Use bi-lingual dictionaries	0	13	2	0	0	0%	32
6	Use mono-lingual dictionaries	0	5	3	4	3	20%	50
7	Skim the text first	0	7	2	3	3	20%	47
8	Read the text several times	0	5	3	3	4	26.6%	51
9	Read as much as possible in target language	0	3	4	3	5	33.5%	55
10	Plan out a text in advance	0	3	3	4	5	33.5%	56

The weighted sum of each strategy was calculated by the summation of each strategy frequency multiplied by the weight of its occurrence. The higher the values are, the better they are. Therefore, it is proved that making summaries as strategy not only has the highest frequency, but also has the highest weighted sum and it is the most favorable strategy of activist for reading comprehension. As it is clear from Table 4.20, Item.10, item.9, Item.2, and Item.1 are among the most frequently used strategies, and item.5 (use bi-lingual dictionaries) has the least frequency and also the least weighted sum.

Discussion

In summary the findings of the present study support those of Matthews (1996) and Oxford (1990) pointing that learners with various learning styles vary in their performance in different tasks and in their academic performance. This study in turn, reinforces the significance of meeting learners' learning styles in an educational setting. It has been considered that teaching in harmony with students' learning style preferences can influence their achievement (Kroonenberg, 1995). Thus, teachers should be keen to the learners' learning style variation specially in designing language skill courses in order to accommodate the diversity in the classroom, so study accordingly investigated the impact of learning style variation on EFL learners' performance in reading skills test and also their strategy use. The first research question of the present study addressed candidates' cognitive style preferences. The researchers calculated the descriptive statistics such as frequency and percentage. Based on the results of descriptive statistics, a majority of candidates were recognized as Reflectors followed by Pragmatists, Activist, and Theorist. In fact, according to the questionnaire Iranian EFL learners in this study were more interested in observation, issues analysis, and tended to think carefully before taking action or making conclusion which are the characteristics of Reflectors. The second research hypothesis of the study denoted that there is a significant difference between individual learning style and test performance of candidates. To reject or retain this hypothesis, the group statistics was first obtained for each group and their test performance. Following that, the One-Way ANOVA was run to analyze and compare the mean scores between the four groups of learning style. Based on the findings, activists had a better performance. Moreover, the results of One-Way ANOVA revealed that there was a statistically significant difference across the groups of learning styles and their performance in reading tests. In fact, the performance of Iranian candidates in reading examination could be affected by their type of learning style preference. In terms of strategy use researchers investigated the most frequent strategies that activists have used. The weighted sum of each strategy was calculated by the summation of each strategy frequency multiplied by the weight of its occurrence. The higher the values are, the better they are. As it was repeatedly mentioned in the study, candidates belonging to learning style activists were the most successful in both gaining higher band scores and frequency of strategy use. So in terms of strategy use as an example, it was proved that making summaries as a strategy not only has the highest frequency, but also has the highest weighted sum and it is the most favorable strategy of activist for reading.

Conclusion

As stated before, this study made an attempt to investigate the effects of various learning styles on Iranian EFL learners' test performance in reading skill and also on their strategy use. Based on findings of the study, a majority of candidates were recognized as reflectors but activists had a better performance in IELTS examination. In fact, each candidate has his or her own individual traits that uniquely affect his or her behavior in doing different tasks and using different strategies.

The findings of the study nonetheless have several implications for classroom practices. Firstly, they draw teachers' attention to individual differences and personal preferences when teaching and testing skills. Secondly, by considering variation due to differences across individuals' learning styles and strategy uses, also the most appropriate task types can be chosen in terms of questions to lessen the risk of question bias. Finally this research may pave the way in which changes occur in order to make an English test a fair measure of test takers' ability. Moreover, the results of the study may help test takers be aware of the influence of their learning

styles and language learning strategy uses on their performance on the IELTS examination, and thus candidates can do further practices to select the best strategies or to control the effect of their learning styles and benefit from them.,

It is worth mentioning that according to Kolb (1985), no particular learning style should be considered as superior over another. Instead, strong preference in all four styles is needed. Therefore, the present findings would enable the candidates to be aware of their dominant learning style preferences. Learners need to be more balanced in their learning styles, and become more active participants in the learning process (Bilgin2003). Otherwise, their achievement in any field would be limited by their learning behavior.

The more we learn about individual differences, the more complex the field becomes (Seven 2012). We are learning that what we thought is really an ambiguous amalgamation of multiple factors. We are also gaining a sense of how many different ways we can understand, how we work, both as students and teachers, and how much we are both different and similar. This seems to be a very suitable time for untangling the issues related to how individuals learn languages, how and why they undertake and succeed in language study, and how one person differs from another in styles, strategies, and motivations, among other attributes, and he succeeds in his or her own way (Sternberg 1998). There exist some questions that need to be answered by further research studies in this regard ,questions like: How can teachers and program administrators be trained to make better use of what is known about individual differences to achieve success in educational programs?

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