

The Effect of Visual/Verbal Learning Style on Reading Comprehension

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Abstract – This study was designed to explore the effect of learners' learning styles (i.e., learners' visual and verbal styles) in multimedia-based reading comprehension. To this end, a software program was designed and 80 intermediate Iranian EFL learners were asked to participate in the study. The Felder and Solomon's (2001) index of learning style (ILS) questionnaire was administered to the EFL learners from three language institutes in Bushehr. Before administering a reading comprehension test, they were randomly divided into 4 groups, all read texts with visuals. Descriptive statistics showed that the participants varied in their preference for particular learning styles with a large number of the participants having balanced preference for visual and verbal learning styles. A one-way ANOVA revealed a significant difference between three preferences of visual-verbal styles (moderate, strong and balanced) in terms of their reading comprehension scores. The results imply that it is vital for EFL teachers be aware of diverse needs of EFL learners and respond flexibly by employing a broad range of teaching techniques to better reach the EFL students with different learning preferences.

Keywords: reading comprehension; learning style, multimedia-based texts

I. INTRODUCTION

The emergence of communicative approach which aimed at providing meaningful and real communication has given the central attention to learners as the center of the learning process as well as to their needs on real-life communication. Actually, since the 1980's there has been a renaissance of interest in providing activities which put emphasis on learners' learning styles and needs so as to fulfill learning goals. In other words, teaching quality is deeply affected by student's characteristics, the teacher's teaching styles, and teaching environment (Keefe, 1987).

Learning style is "the characteristic cognitive, affective, social, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (MacKeracher, 2004, p.71). In other words, learner style has opened up a whole gamut of new experiences for learners to acquire new language in the way that learners can perceive, interact with, and respond to the learning environment.

Accordingly, when learning style is tailored to the dominant learning style of learners, learning is facilitated. Actually, learning is greatly facilitated when a match between students' style and teaching methods is established (Felder, 1995; Jonassen & Grabowski, 1993). When a careful consideration is given to the learners' learning style, teachers encourage a sense of responsibility in their learners so that learners will be acquainted with their own learning

style, and thereby, perform according to their style in process of language learning. In this way, learners acquire a surge of information without any need for the assistance of others and, therefore, their learning will be enhanced. When learners are responsible for their learning, they ascribe meaning to the process of learning. Learners expand an understanding of their own form of learning style, get great satisfaction from the environment they interact with, and enhance their learning (Coffield, Moseley, Hall, & Ecclestone, 2004).

Students in language classrooms have entirely different learning profiles. While some learners prefer to think and work alone (reflective learners), others learn better in groups (active learners); some learners understand information in linear step (sequential learners), others look at all the parts of a problem or situation together (global learners); some learners like to learn concrete material and tend to be practical (sensing learners) whereas other learners prefer to learn abstract material such as theories and their meanings (intuitive learners). And finally, some learners learn primarily with visual elements including image or picture (visual learners) or with verbal elements including words or texts (verbal learners) (Felder & Solomon, 2001).

For many researchers (e.g., Celcia-Murcia, 2001; Felder & Solomon, 2001; Gardner, 1999), learning style category includes visual and verbal learning style. Actually, the category of visual and verbal learning style can make a significant contribution to second language learning in general, and L2 reading comprehension, in particular, in a multimedia learning environment. It can be argued that while the use of visualization within the realm of computer as a teaching technique for reading can accomplish visual learning style, verbal information as the traditional technique can fulfill the need of verbal learners. In the light of the purpose of this study, visualization in the multimedia-based environment is described as the use of picture and text in a multimedia-based reading course so as to fulfill the need of both verbal and visual learners. Actually, when visual or verbal learners are presented with teaching or learning circumstances in line with their learning style, they will integrate their learning style in the process of learning to learn more easily. Moreover, as Biggs (2001) points out, learners when knowing their dominant learning style become an effective problem solver of their learning so that they can take over their own learning.

In general, it is important for readers to be educated in areas appropriate for their learning styles. Readers educated in suitable mode of their learning style have great confidence in learning and may be more successful readers (Gilakjani, 2012). Whereas visual readers get maximum benefit from visual materials during reading, verbal readers are all highly motivated with verbal materials. In this regard, this study attempts to investigate if there is any significant difference between visual-oriented and verbal-oriented learners' reading comprehension of a multimedia-based text. It might be expected that visual-oriented and verbal-oriented learners' will significantly differ in terms of reading a multimedia-based text.

II. LITERATUREREVIEW

When learning style is tailored to the dominant learning style of learners, learning is facilitated. In other words, teachers should aim at making favorable condition in their classroom that will be beneficial to every learning style (Jonassen & Grabowski, 1993; Felder, 1995). Accordingly, multimedia learning as one way of considering learners' learning styles in educational contexts provides an appropriate platform for learning. In other words, multimedia creates an appropriate situation for the learner in order to manage the information in a way that mirrors his learning style, thereby developing the retention and retrieval of knowledge (Norman, Genter, Steven, 1976). In fact, multimedia instructional material reflects how students think, learn, and remember. Because of the high degree of learner control and the ability to match up with many learning styles, multimedia adjusts well to individual differences (Ramsey, 1996).

Soylu and Akkoyunlu (2009) carried out a study to investigate the effect of learning styles on students' achievement in different learning environments. They selected 39 participants from the department of computer education and instructional technology at Hacettepe University. Utilizing Kolb's Learning Style Inventory (LSI, 1976), the authors attempted to categorize individuals on the basis of their self-reported preferred learning style. Three different learning environments which were designed within the scope of their study were: a text-based learning environment, a narration-based learning environment, and a computer-mediated (narration + music + text + static picture) learning environment. They reported that learning styles did not have effects on the achievement of students in different learning environments.

In another study, Aripin, Mahmood, Rohaizad, Yeop, and Anuar (2008) scrutinized the relationship between academic performance of university students and their learning styles. They selected their participants from the first year students at the International Education Center (INTEC). The result of the study divulged that even though there was no strong correlation between learners' learning style and academic performance, there was an indication that those who were more participative tended to perform better academically at the end of their first semester at INTEC. There was also an indication that highly independent learners (ignoring the level of the other learning styles) were more likely to achieve better grades than those who were not.

Moreover, Riazi and Riasati (2007) carried out a study to investigate learning style preferences of Iranian EFL learners. The result of their study showed that these students preferred to be actively engaged in class activities. They tended to have interactions with other students in the class. In another study, Kassaian (2007) examined the effect of two types of teaching methods on the retention of unfamiliar words. 66 EFL learners having either auditory or visual learning styles participated in teaching method environments which were either visual or aural. The result of the study revealed that while the subjects with aural style of learning did not show better retention for items they had learned aurally, visual learners performed better in recognition test for visually-presented items. Actually, all the subjects retained visually-presented items better than aurally-presented items in the immediate and delayed tests.

Conducting research on investigating the effect of visual learning style, Kia, Alipour, and Ghaderi (2001) found that among students in Payame Noor University in Iran, those with visual learning style have the greatest academic achievement. In line with the above mentioned objectives, the present study is an attempt to provide answers to the following question:

- What is the effect of L2 learners' learning style on reading comprehension of multimedia-based texts?

III. METHODOLOGY

A. Participants

For the purposes of this study, 80 intermediate EFL learners were selected randomly from a larger sample of 120 EFL learners from three private language institutes in Bushehr through a placement test. They included both male ($n = 30$) and female ($n = 50$) students whose ages ranged from 18 to 24, with Persian as their L1. The selected participants comprised four groups (each with 20 EFL learners).

B. Instruments and Materials

To collect data, this study made use of two instruments and a software program. The first instrument was the Oxford Placement Test (OPT, 2007), which consisted of 50 multiple choice questions. The second instrument was a reading comprehension test, developed and embedded in the software to assess the participants' reading comprehension ability. This test consisted of 31 true/false and 49 multiple-choice items. The validity of the reading comprehension was examined through content and concurrent validity. Moreover, the internal consistency of the reading comprehension test, estimated through conducting Cronbach's alpha.

A software with four computer-based modules was produced by a computer technician to present multimedia-based reading texts. This software package, installed on all versions of windows, was able to show multimedia texts.

C. Procedures

To collect the data, the OPT was given to 120 EFL students from the language institutes in Bushehr. Those who scored above 31 on grammar and language use and above 8 on reading part were selected as intermediate EFL participants of the study. To investigate the research question of the study, subjects were given multimedia-based texts.

Firstly, the participants completed the consent form and the background questionnaire, which were one part of the software. Then, they were asked to read reading texts embedded with the visuals. After the reading of each reading text, all groups were provided with the reading comprehension test including true/false items and multiple-choice items. Finally,

Soloman and Felder's (2001) learning style questionnaire was given to the participants in order to determine their learning style. After that, the data set was organized according to the research question of the study and by SPSS (SPSS Inc., 2012).

IV. RESULTS

Table 1 shows the descriptive statistics of learners' preference of different learning styles. As demonstrated in the table, each learning style has three points of preference. The moderate and strong preference shows the tendency towards one dimension of learning styles. The balanced preference shows a fairly well balanced tendency towards the two dimensions of that scale. As shown in Table 1, the only learning style that the participants of the study showed their balanced preference was visual/verbal style of learning. 55 percent of the learners in this study had an adequate balance between their verbal and visual learning style.

Table 1: Descriptive Statistics of Learners' Preference of Different Learning Styles

		Frequency	Percent
Active/Reflective	Balanced Preference	14	17.5
	Moderate Preference	47	58.8
	Strong Preference	19	23.8
Visual/Verbal	Balanced Preference	44	55.0
	Moderate Preference	12	15.0
	Strong Preference	24	30.0
Sensing/Intuitive	Balanced Preference	16	20.0
	Moderate Preference	26	32.5
	Strong Preference	38	47.5
Sequential/Global	Balanced Preference	34	42.5
	Moderate Preference	24	30.0
	Strong Preference	22	27.5
Total		80	100

To investigate the research question of the study i.e., whether the learning style had any significant effect on L2 learners' reading comprehension of multimedia-based texts, A one-way ANOVA was performed in order to see the differences between three preferences of visual verbal preferences and their reading comprehension scores. The results are reported in Table 2.

Table 2: ANOVA on Visual/Verbal Learning Style and Reading Comprehension

Total Scores	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	999.452	2	499.726	21.138	.000
Within Groups	1820.348	77	23.641		
Total	2819.800	79			

As demonstrated in Table 2, the results showed that there is a significant difference between three groups of learners' preferences in visual/verbal learning style and their reading comprehension ($F = 21.13, p < .05$). In other words, learners' learning style has a significant effect on their reading comprehension of multimedia-based texts. Since F value was significant, Scheffe post-hoc test was conducted. The results are reported in Table 3.

Table 3: Scheffe Post-hoc Test

Multiple Comparisons						
Dependent Variable: Total Scores		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Scheffe					Lower Bound	Upper Bound
Balanced Preference	Moderate Preference	6.470*	1.583	.001	2.52	10.42
	Strong Preference	7.386*	1.234	.000	4.31	10.47
Moderate Preference	Balanced Preference	-6.470*	1.583	.001	-10.42	-2.52
	Strong Preference	.917	1.719	.868	-3.37	5.21
Strong Preference	Balanced Preference	-7.386*	1.234	.000	-10.47	-4.31
	Moderate Preference	-.917	1.719	.868	-5.21	3.37

*. The mean difference is significant at the 0.05 level.

As Table 3 demonstrates, all contrasts show a significant difference in reading comprehension of learners' different preferences, except between moderate and strong preference of visual and verbal learning style.

V. CONCLUSION

Notion of learning style has critical role in the process of language. This study conducted to investigate effect of EFL learners' learning style on their reading comprehension of multimedia-based texts. The result of this study indicated that 55 percent of the learners in this study had an adequate balance between their verbal and visual learning styles. The results showed that there is a significant difference between three groups of learners' preferences in visual/verbal learning style and their reading comprehension ($F = 21.13, p < .05$).

Since F value was significant, Scheffe post-hoc test was conducted. The results showed that all contrasts show a significant difference in reading comprehension of learners' different preferences, except between moderate and strong preference of visual and verbal learning styles.

Researchers in the field of learning style decided in favor of teaching in a balanced style (Felder, 1995; Peacock, 2001). Considering the individual needs of students with different learning styles and integrating various techniques assist learners in development of their learning. In a language context, for example, global and inductive students benefit more when new structure is presented in context than when grammatical explanation are provided for that structure. Role plays will be of great benefit to kinesthetic and verbal learners. A reflective student will benefit from classes in which they have a short break to reflect on what being presented and active students will get the full benefit from active class participation. Since there are many visual learners than verbal learners at the university, it is good to provide condition at the universities to consider the needs of verbal learners by providing material in the form of both visual and verbal presentations (Felder, 1995; Peacock, 2001).

In this study, compared to student with a more dominant visual learning style, students with a balanced visual-verbal learning style indicated better performance in the reading comprehension test.

Our results are significantly consistent with generative theory of multimedia learning (Mayer, 1994) and dual-coding theory (Paivio, 1991). Mayer (1994) offers designed principles of multimedia instructional materials. The basic principle of the generative theory of multimedia learning is that learners vigorously construct knowledge and are involved in a meaningful learning process. Mayer (1994) maintains that when learners willfully pick information from presented stimuli, systematize information into coherent representations, and then make efforts to assimilate new information with other information, a meaningful process will occur. This study assumed that when learners can pick information both verbally and visually than when they have access only to one mode of information, learning occurs more effectively. This study also supposed that compared to verbal learners who benefit more from verbal materials, visual learners mostly profit from visual materials. However, a balanced visual-verbal learning style will be of great benefit to our outcomes. That is, learners with a balanced visual-verbal learning style acquire language more effectively and efficiently. Students' performance on reading test was best when they utilize both verbal and visual information (e. g., balanced visual-verbal learning style). In conclusion, students

perform moderately on reading comprehension test when they select only one mode of information.

With the advancement of constructivist views of learning, many researchers embark on giving a picture of individual differences in the way people process information and gain understanding from different constructs. A large body of L2 learning research has looked at individual learner differences and their effects on learning various skills. In this regard, learning style, one of individual learner differences, has aroused considerable interest in process of second language learning. When learning style is tailored to the dominant learning style of learners, learning is facilitated. In other words, learning is greatly facilitated when a match between students' style and teaching methods is established, that is teachers should aim at making favorable condition in their classroom that will be beneficial to every learning style (Jonassen & Grabowski, 1993; Felder, 1995). Therefore, understanding and exploring each individual's learning style can be very useful and beneficial to the student by assisting them in becoming more focused on an attentive learner, which finally will enhance educational success. Discovering learning style will provide an opportunity for the student to determine his or her own personal strengths and weaknesses and learn from them. Actually, teachers can integrate learning styles into their classroom by recognizing the learning styles of each of their students, establishing a match between teaching style and learning style for difficult tasks, reinforcing weaker learning styles through easier tasks, and teaching students, learning-style selection strategies (Gilakjani, 2012).

Accordingly, multimedia learning as one way of considering learners' learning styles in educational context provides an appropriate platform for learning. In other words, multimedia creates an appropriate situation for the learner in order to manage the information in a way that mirrors his learning style, thereby developing the retention and retrieval of knowledge (Norman, Genter, & Steven, 1976). In fact, multimedia instructional material reflects how students think, learn, and remember. Because of the high degree of learner control and the ability to match up with many learning styles, multimedia adjusts well to individual differences (Ramsey, Williges, & Beaton, 1996). Actually, multimedia-based learning, presenting information both verbally and visually, can provide an appropriate situation for learners with different learning style. More importantly, it is expected that visual learners as well as verbal learners can highly benefit from multimedia-based learning. In the current study, learners with a balanced learning style were the most successful readers in instructional context.

And, technical developments can make it easier to create a multimedia studying environment in which graphics can be added to conventional text-based materials so that L2 learners can improve their reading skill. Besides, this study provides learners with both option of visual and verbal for selecting and processing materials. Therefore, material developers can present and develop learning material both verbally and visually to facilitate learning. In the present study, students comprehended reading texts better when they were provided with both visual and verbal materials. By implication, when verbal and visual materials are presented in the classroom, more meaningful learning occurs.

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