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Research Paper

The Effect of Teaching Vocabulary through PowerPoint Designed Vocabulary Organizers on Different Learning Styles of Pre-intermediate Iranian EFL Learners

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Abstract

Throughout the last decade, vocabulary teaching seems to be one of the trending areas of research. In this case, teaching vocabulary through multimedia or Computer-Assisted Language Learning (CALL) has received special attention. Different students with various learning styles may benefit from CALL differently. The study focuses on the effect of teaching vocabulary through PowerPoint Designed Vocabulary Organizers (PDVOs) on learners with different learning styles. Based on their responses to a learning style determiner questionnaire, 267 pre-intermediate (determined by Nelson English language test) male students were assigned into five groups; a control group and four experimental groups of Visual, Auditory, Read/Write, and Kinesthetic (VARK). 100 pre-selected words were taught to the experimental groups through the PDVOs. On the other hand, the control

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group learned those words through a traditional method. The research hypotheses were tested by Analyze of Covariance, Paired Sample T-test, and Wilcoxon Test. The results revealed that the students significantly gained better results being taught through the PDVOs compared to the traditional one. It was also found that all students with one of the four VARK learning styles significantly improved in scores after the intervention. Taking a deeper look, Visual and Kinesthetic learners' improvements were notably higher than the Auditory and Read/Write learners. Finally, using Gardner's Attitude/Motivational test battery, it was revealed that the students have significant positive attitudes toward being taught by the PDVOs. The findings of the present study indicated that using multimedia that provides vocabulary items through different channels can be beneficial in vocabulary teaching; especially for teaching vocabulary items to Visual and Kinesthetic learners.

Keywords: Vocabulary, PowerPoint Designed Vocabulary Organizers, CALL, Learning Styles, VARK Learning Styles

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1. Introduction

Through recent years, instructors have shown an increasing interest in vocabulary compared to the other domains. The significance of vocabulary for overall foreign language learning is the premise of studies in vocabulary learning (Nation, 2001; Nikolova, 2002). Over the last decades, English Language Teaching (ELT) teachers all over the world were trying to foster the effectiveness of their instructions by employing different methods, classroom techniques, and materials used for those instructions. Multimedia has been effectively applied to numerous courses to provide a wide variety of learning styles or modalities (Birch & Gardiner, 2005). Among the researches that have been done in the field of vocabulary learning strategies and learning

styles none of them has fully covered the relationship between all VARK learning styles and vocabulary learning strategies. The focus of the previous studies has mostly been on the visual and auditory learning styles and in most of them kinesthetic and read/write learning styles were not under focus. The present study seeks to consider the effect of teaching vocabulary through PDVOs on vocabulary learning of students with kinesthetic and read/write, in addition to the visual and auditory learning styles. Therefore, the purpose of the study is to test this way of presenting words and compare it with the conventional-traditional methods. Furthermore, as we have VARK learning styles, the effect of this method on each of these learning styles is going to be investigated. Also, considering students' attitudes as an important factor in learning, this study will compare this factor before and after the intervention.

There are three research questions in this study:

1. Is there any significant difference between teaching English vocabulary through PDVOs and a traditional method?
2. To what extent does teaching vocabulary through PDVOs affect the vocabulary learning of students with different learning styles?
3. Is there any change in students' attitudes toward learning English before and after using PDVOs?

2. Review of the Related Literature

2.1 Vocabulary and L2 Learning

Numerous studies have shown the importance of vocabulary learning in second language acquisition. Improving students' vocabulary is a very important need if we want to improve the advanced literacy stages and levels required for successful accomplishment of school and beyond (Biancarosa & Snow, 2006; Graves & Watts-Taffe, 2008). Vocabulary knowledge is also essential for all language skills. For instance, Groot (2000) stresses the fact that mastery of a large number of words is the premise for L2 reading proficiency.

Schmitt (2000) states that vocabulary acquisition has two approaches: explicit and incidental vocabulary learning. In short, in explicit learning, the student is conscious of what has been learned, but in the incidental type of vocabulary learning, there is no awareness of what has been learned. Incidental vocabulary learning consists of indirect attention to the target words. Explicit learning is time-consuming and it seems too laborious to learn the target words. On the other hand, in incidental learning, the language is used for communicative goals. However, it should be mentioned that this process is slower and more gradual and it lacks explicit attention to the target words compared to explicit learning. However, the impact of explicit instruction is still under debate (Taka, 2008). Using the explicit type of vocabulary instruction (the focus of this study), teachers ensure that vocabulary instruction is happening in a logical-systematical way.

2.2 Learning styles

Over the last decades, ELT teachers all over the world were trying to foster the effectiveness of their instructions by employing different methods, classroom techniques, and materials used for those instructions. Most of these efforts improved ELT a lot but they didn't seem to be fully effective and gaps still exist. Scholars stated that one reason for such gaps may be individual differences in acquiring language. Age, gender, motivation, social status, culture, and learning styles are some of these influencing factors. Because of this, it seems that instructors gradually accepted that each of their students learn differently.

Keefe and Ferrell (1990) define the term learning style as the composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (p. 59). In the importance of considering learning styles Dunn & Dunn (1978) claim that higher scores

will be attained if students are familiar with their preferred learning styles. The process of identifying someone's learning style is challenging and we might encounter a lot of problems (Tyacke, 1998). The complexity of learning styles, learners' tendency to use different learning styles in different situations and biased methodology in determining of learning styles are some of these problems (Mohammadi, 2013). In his research about learning style preferences among ELT learners, Reid (1987) found a strong learners' tendency to Tactile and Kinesthetic compared to Visual and Auditory learning styles. On the other hand, most students showed not much interest in group learning.

VARK was firstly designed by Neil Fleming (1992) as a form of a questionnaire. This questionnaire examines learners' learning preferences and considers these as learning approaches. He mentions that VARK focuses on some modalities that learners might prefer for learning. The acronym VARK stands for Visual, Aural, Read/Write, and Kinesthetic sensory modalities used for learning different kinds of information (Fleming & Mills, 1992). "The Visual learners prefer to receive information via their eyes. The Aural orientated prefer hearing information. The Read/Write orientated prefer information displayed as words. The Kinesthetic learners learn by doing, simulated real-world experience and practice" (Janvier & Ghaoui, 2002).

2.3 CALL

Over the past decade, a dramatic increase in the use of computers in educational settings can be seen (Warschauer, 1998). The use of computer in language teaching has probably emerged since 1960s. Multimedia has been effectively applied to numerous courses and helped a wide variety of learning styles or modalities (Birch & Gardiner, 2005). In this case, Santrock (2001) also claims that one of the teaching strategies which is suitable for children's engagement in learning is utilizing media and technology effectively as part

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of effort to vary the pace of the classroom and focus on active learning to make learning interesting. New computer software played effective roles in language teaching; especially vocabulary teaching.

Benefiting from multimedia may not be the same among the learners; so, it might better work for some learners. Based on their learning styles, students may have different preferences to learn, so they may learn from the multimedia that are according to their preferences. The great effect of multimedia on learning is inevitable and teachers can use them to enhance the effectiveness of their learning.

Learning with multimedia may be effective particularly for some of the mentioned learning styles. As can be seen in Pouwels (1992) study that was about acquiring vocabulary in combination with perpetual learning styles and memory research, a positive correlation between items combined with pictorial and verbal aids and the visual modality was reported. On the other hand, too much amount of visual data with visual aids interfered with vocabulary acquisition of the auditory learners (Pouwels, 1992).

Teo et al. (2022), Spiri (2008), Constantinescu (2007), Loucky (2006), Horst et al. (2005), and Nelson (1998) are some studies that investigated the effect of CALL on students' vocabulary learning.

2.4 The Impact of Technology on Learners' Attitude

Considering EFL as a challenging process, teachers should do their bests to develop new and innovative techniques and methods to engage learners. So, developing positive language attitude, motivation, and encouragement in each learner is essential (Gardner, 2010). In this case, technology might be a good choice. It can have a positive effect on learners' attitudes in the process of learning (Reeves, 1998). Technology gives students the opportunity to experience language learning in the real world. Furthermore, because of the

possible interest that technology produces in learners, it helps learners to be involved, eager and active in the classroom (Johnston & Barker, 2002).

A relative same study was conducted by Akhlaghi and Zareian (2015). They examined the effect of PowerPoint presentations on vocabulary and grammar learning of 54 Iranian high school EFL students. Two groups of experimental and control were obtained. The experimental group was taught by PowerPoint slides while the control group was taught by a traditional method. Finally, it was found that students had a positive attitude toward learning through PowerPoint.

Other studies such as Harknett and Cobane (1997), Santos and Patton (1998), Daniels (1999), Lowry (1999), Kask (2000), Frey and Birnbaum (2002), Nation (2001), and Rajabi and Ketabi (2011) also investigated the impact of technology on learners' attitude. This study is going to investigate the effect of PowerPoint organizers on learners' attitudes.

3. Method

3.1 Participants

The study was conducted at *Shahed Shahid Shahab* and *Alameh Tabatabaei* high schools of Birjand, Iran. From these two schools, 340 students from the whole population which was 427 were chosen randomly. The participants were male learners with ages ranging from 13 to 16. Around 80% of them experienced language institutes besides learning English at school. In order to make sure their homogeneity and regard their language proficiency levels, a pre-validated version of the Nelson Vocabulary Test (Test 200A) by Fowler and Coe (1976) was given to those 340 students. From the whole population, a sample of 303 participants whose proficiency levels were determined to be pre-intermediate were selected. The students were divided into five groups. One control group and four experimental groups. To determine the learning styles of the students in the experimental group, the *VARK questionnaire* for

younger people was given to the students. The researcher translated this questionnaire into Persian. The validation and comprehensiveness of the translation was admitted by three professionals in the field. Also, the permission for using and translating the questionnaire was taken through email communication with the website. Because of the ease of study, those who had mixed learning preferences were disregarded. For this reason, 36 students were put aside from the whole population and the number of participants after that decreased to 267 (N = 267). So, the experimental group itself was divided into four experimental groups of Visual, Auditory, Read/Write, and Kinesthetic.

3.2 Instrumentation

To ensure the homogeneity of the participants in terms of levels, a standardized test called Nelson vocabulary test (Test 200A) from book 2 (Intermediate) by Fowler and Coe (1976) with suitable validity and reliability was given to the participants. A guide was used to select participants with pre-intermediate levels which is the target level for this study. The results of the pilot study on 10 students who were not among the participants indicated that the Cronbach's alpha value for this test is .82.

Attitude/Motivation Test Battery or AMTB is a well-known test consists of 101 items developed by Gardner (2004) that is used for measuring individuals' levels of attitude and motivation toward learning the language. The questionnaire used in the present study was adopted from AMTB. For the sake of meaningfulness and convenience and to avoid language deficiency, the researcher decided to use a Persian translation of AMTB. A Persian translation was provided by Zolgharni (2018). Based on her notes in her thesis, Zolgharni's translation is reported to have acceptable validity and reliability. The researcher though, selected 50 questions from the whole 101. This editing was because of the shortage of time we had in classes due of the

Corona pandemic. The students were required to answer the questions in a six-point Likert-format with the answer scales starting from strongly disagree to strongly agree. The results of the pilot study on 10 students who were not among the participants indicated that the Cronbach's alpha value for this questionnaire is .78.

To determine the students' learning styles in the experimental group, the "VARK questionnaire for younger people" retrieved from the VARK-learn website (2019) has been used. The researcher translated this questionnaire into Persian. The validation and comprehensiveness of the translation was admitted by three professionals in the field. Also, the permission for using and translating the questionnaire was taken through email communication with the website. The students should choose the answers that best explain their preferences. The researcher used a guide to determine their learning styles. The results of the pilot study on 10 students who were not among the participants indicated that the Cronbach's alpha value for this questionnaire is .82.

For the pre-test of this study, the researcher used a researcher-made test of vocabulary items consisting of twenty multiple-choice tests to measure the students' knowledge of words before the intervention. The validity of the test was approved by three experts in the field. In order to ensure the content validity of the test, some items were modified based on the experts' suggestions. The results of the pilot study on 10 students who were not among the participants indicated that Cronbach's alpha value for this test is .80. The same multiple-choice test with different questions and choices orders was administered after the intervention as the post-test.

3.3 Materials

The book *504 Absolutely Essential Words* sixth edition by Bromberg and Liebb (2012) was chosen as the source of the target vocabulary items. The

researcher chose the first 100 words of this book and decided to teach these words in ten sessions; 10 words for each session.

Those 100 chosen words were provided to the experimental group in the form of researcher-made PowerPoint slides. Each word was introduced in 5 slides; each slide was suitable for some the mentioned learning styles (Figure 1).

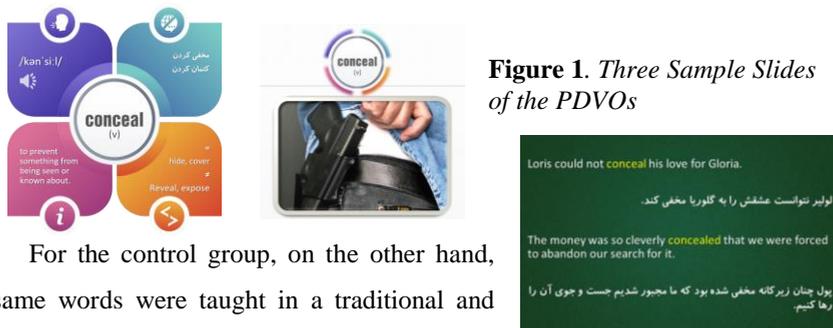


Figure 1. Three Sample Slides of the PDVOs

For the control group, on the other hand, same words were taught in a traditional and conventional way through printed texts. Persian translation, synonyms and antonyms, and English definition and pronunciation of the words were provided to them in a handout.

4. Results

In order to statistically describe the research variables, descriptive statistics tables and indicators were used. Also, in order to make inferential analyzes and test the research questions, analysis of covariance, mean comparison test of two dependent groups, and non-parametric Wilcoxon test were used.

4.1 Research Hypothesis 1

Based on the results of the table below, because the significance level of the group factor (sig = .03 and F = 4.39) was less than the significance level of .05, it can be said that the two methods used had a significant effect on the score. Therefore, the adjusted mean of the post-test scores in the traditional group (14.28) had a significant difference with the adjusted mean of the post-

test scores in the PDVOs group (15.87). Also, the effect size of .016 indicates the fact that about 1.6% of the score changes are due to the effect of the training method. So the first hypothesis of this study is rejected.

Table 1*Tests of Between-Subjects Effects for Research Question 1*

Dependent Variable: post-score						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	631.888 ^a	2	315.944	32.140	.000	.196
Intercept	7634.297	1	7634.297	776.616	.000	.746
Pre-score group	467.723	1	467.723	47.580	.000	.153
Error	43.193	1	43.193	4.394	.037	.016
Total	2595.176	264	9.830			
Corrected Total	65146.000	267				
Corrected Total	3227.064	266				

4.2 Research Hypothesis 2

In order to investigate the difference between the means of the four groups, the covariance analysis test had been used that is presented in Table 2.

Table 2*Tests of Between-Subjects Effects - Research Question 2 Post-test*

Dependent Variable: post-score						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	413.434 ^a	4	103.358	13.186	.0001	.256
Intercept	4726.505	1	4726.505	602.990	.0001	.798
Pre. score group	298.269	1	298.269	38.052	.0001	.199
Error	115.272	3	38.424	4.902	.003	.088
Total	1199.281	153	7.838			
Corrected Total	41455.000	158				
Corrected Total	1612.715	157				

Based on the results of the above table, because the significance level of the group factor (sig = .003 and F = 4.90) was less than the significance level of .05, it can be said that the post-test score significantly increased among all

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learning style groups. Therefore, based on the results of the Table 3 which shows multiple comparisons, the mean post-test scores adjusted in group K (16.94) had a significant difference with the mean scores adjusted in group R (15.02), group K (16.94), and the mean scores adjusted in group A (15.28). Furthermore, the mean of post-test scores adjusted in group R (15.02) was significantly different from the mean of scores adjusted in group V (16.76). Also, the effect size of .088 reflects the fact that about 8.8% of post-test score changes were the effect of the training method.

Table 3
Multiple Comparisons Between Learning Styles

Group	Group	Mean Difference	Std. Error	Sig.
Kinesthetic	R	1.9203 [*]	.61509	.012
	A	1.6555 [*]	.63305	.049
	V	.1765	.66553	.993
Read/Write	K	-1.9203 [*]	.61509	.012
	A	-.2649	.57979	.968
	V	-1.7439 [*]	.61509	.027
Auditorial	K	-1.6555 [*]	.63305	.049
	R	.2649	.57979	.968
	V	-1.4790	.63305	.096
Visual	K	-.1765	.66553	.993
	R	1.7439 [*]	.61509	.027
	A	1.4790	.63305	.096

Figure 2 shows the average post-test scores of the students in four groups. As can be seen, students in groups K and V have the highest average. Based on these results, the second hypothesis of this research is rejected.

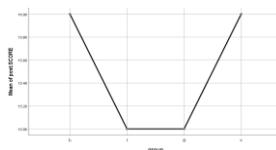


Figure 2. Line chart of the average post-test scores in four groups

4.3 Research Hypothesis 3

The results of the Table 4 show that in most people the rate of Motivation, Attitudes towards the learning situation, Integrativeness, Parental encouragement which were the subdivisions of attitude had increased after training by PDVOs method.

Table 4
Attitude Elements Ranks

		Ranks		
		N	Mean Rank	Sum of Ranks
Motivation.pos - Motivation.pre	Negative Ranks	0	.00	.00
	Positive Ranks	158	79.50	12561.00
	Ties	0		
	Total	158		
Integrativeness.pos - Integrativeness.pre	Negative Ranks	57	51.65	2944.00
	Positive Ranks	86	85.49	7352.00
	Ties	15		
	Total	158		
Attitudes toward the learning situation.pos - Attitudes toward the learning situation.pre	Negative Ranks	6	9.67	58.00
	Positive Ranks	137	74.73	10238.00
	Ties	15		
	Total	158		
Parental encouragement.pos - Parental encouragement.pre	Negative Ranks	61	56.89	3470.50
	Positive Ranks	74	77.16	5709.50
	Ties	23		
	Total	158		

Table 5 shows the test statistics for attitude elements. Significance of Z value at error level less than .05 indicates the difference between Motivation in pre-test and post-test, Integrativeness in pre-test and post-test, Attitudes towards the learning situation in pre-test and post-test and Parental encouragement in pre-test and post-test and the average of these variables had increased in the post-test stage. It can be concluded that PDVOs training had increased attitude in all related scales. Thus, the third hypothesis of this research is rejected.

Table 5
Test Statistics for Attitude Elements

	Motivation	Integrativeness	Attitudes toward the learning situation	Parental encouragement
Z	-10.916	-4.455	-10.270	-2.478
Asymp. Sig. (2-tailed)	.0001	.0001	.0001	.013

5. Discussion and Conclusion

This study aimed to investigate the effectiveness of teaching vocabulary through PowerPoint Designed Vocabulary Organizers (PDVOs) and compare the results with a traditional method. In this study, we considered the students learning preferences and categorize them into four VARK (V: Visual, A: Auditorial, R: Read/Write, K: Kinesthetic) groups. In other words, it investigated a better way to teach vocabulary items considering the students learning styles and attitudes toward learning English.

The results confirmed the findings of the previous studies. The students significantly gained better results being taught through the PDVOs method compared to the traditional one. This finding is correlated with many studies such as Spiri (2008), Constantinescu (2007), Loucky (2006), Horst et al. (2005), and Nelson (1998) who used the relatively same method. All these findings reported the positive effect of multimedia compared to the traditional method.

Also, all students with one of the four VARK learning styles significantly improved in scores after the intervention. On the other hand, Visual and Kinesthetic learners' improvements were notably higher than the Auditory and Read/Write learners. These findings were in line with almost all of the previous studies. A correlation can be found between these results and the reports of Janvier and Ghaoui (2002) who stated that these learners "prefer to receive information, via their eyes" (Janvier & Ghaoui, 2002). In this case,

Benmeddour (2015) mentions that these learners pay more attention to photographs and pictures of videos, reality, movies, or presentations provided through PowerPoints.

Finally, it was determined that the students have significant positive attitudes toward being taught by the PDVOs method which supports most of the findings of the previous studies. These results are in line with the results of previous studies such as Harknett and Cobane (1997), Santos and Patton (1998), Daniels (1999), Lowry (1999), Kask (2000), Frey and Birnbaum (2002), Nation (2011), Zarei et al. (2013), and Rajabi and Ketabi (2011) who investigated the effect of using multimedia on learners' attitude.

Considering the results of this study, some implications are noticed. Based on the observations of the researcher, many of the EFL students seem bored with the traditional and the text version of teaching vocabulary. Using multimedia helped them experience more ways to learn and a deeper understanding will be attained. The significance of knowing one's specific learning style and its effect on vocabulary learning is inevitable. By knowing their specific learning style, students can personalize their learning and experience more efficient acquiring. Knowing their students' learning styles, teachers can choose more appropriate methods and techniques in different classes. Based on the reports and results of this study, using the PDVOs can be a good way to teach vocabulary items and it is recommended to language teachers.

It should be noted that the present study didn't consider learners' ages. Also, the gender of the participants is another influencing factor that hadn't been considered in this study. Another important factor may be ethnic bias. Other studies can be conducted considering the effect of the PDVOs on participants with different genders, ages, and ethnic biases. Also, another

study can be conducted considering learners with mixed learning styles which is a factor that hadn't been taken into account in this study.

Based on the finding of this research, it is revealed that the PDVOs can be a good method for teaching English vocabulary. Also, using this method is highly recommended for teachers who want to instruct Visual and Kinesthetic learners.

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