Exploring the effects of using mixed-modality vocabulary learning strategy on vocabulary retention

Fang-Chuan OU YANG[a*] **& Kuo-Yu LIU**[b]
[a]*Department of Information Management, Chien Hsin University of Science and Technology, Chung-Li, Taiwan*
[b]*Department of Computer Science and Communication Engineering, Providence University, Taichung, Taiwan*
[*]ouyang@uch.edu.tw

Abstract: This study investigated the effects of mixed-modality vocabulary learning strategy use on vocabulary retention. To fulfill the purposes of this study, a CALL system called MyEVA was employed. A within-subjects experiment was conducted to examine the effects of three vocabulary learning tools: MyEVA, internet dictionary, and traditional paper-based dictionary. The findings indicate that mixed-modality with preference strategy setting stimulates the greatest vocabulary acquisition and the best retention for L2 students.

Keywords: mixed-modality, vocabulary learning strategy, vocabulary retention

Introduction

College students should have at least 4000 words to understand and read English textbooks (Hu and Nation, 2001). However, many college students in Taiwan only have less than 2000 words, and therefore have bottlenecks to comprehend their English textbooks (Huang, 2004). Oxford (1990) claimed that vocabulary learning strategy (VLS) can help English learners to recollect plenty of words more effectively. Learners can perform good learning outcomes if they use adaptive learning strategies (Oxford & Crookall, 1990). The results of Tight's study (2010) indicated that instruction through multiple modalities stimulates the better learning and retention than individual preferences. Style matching also promoted significantly greater retention than mismatching. Surprisingly, little work discusses the use of vocabulary learning strategies on e-learning systems. This research aims to fill this gap and focuses on exploring the effects of using mixed-modality vocabulary learning strategy on e-learning systems. A vocabulary learning system called MyEVA (My English Vocabulary Assistant) is developed for this research. In this study, it was observed that L2 students employed three vocabulary tools to memorize the target words, as revealed by the students' pretest/posttest scores of VKS (Vocabulary Knowledge Scale). A sample of 93 L2 undergraduates signed up to participate in the experiments. They were indicated to use the basic mode of MyEVA, the preference mode of MyEVA, internet dictionary (Yahoo Dictionary), and traditional paper-based dictionary. Finally, the researchers analyzed if the mixed-modality vocabulary learning strategy is more beneficial than individual vocabulary learning strategies on vocabulary retention.

1. The Design of MyEVA

MyEVA is a mixed-modality vocabulary learning system including 3,569 TOEIC (Test of English for International Communication) words and 8 VLSs which are designed for L2 students to improve their English vocabulary capability. Students can navigate any one of those VLSs when they study the words to expand their vocabulary size and enhance the retention. The 8 VLSs designed in MyEVA were initially selected from the memory strategy classified by Schmitt & McCarthy (Schmitt & McCarthy, 1997) and then adjusted to be suitable for the L2 students in Taiwan. The 8 VLSs in MyEVA are: *word card strategy, flash card strategy, synonym strategy, antonym strategy, assonance strategy, clipping strategy, grouping strategy, and imagery strategy*. The screenshot of MyEVA is shown in Fig 1.

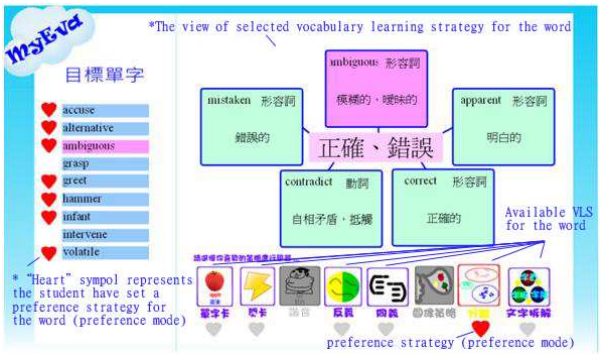

Figure 1. The screenshot of MyEVA

	All Learners (N=93)		Poor Learners (N=54)		Good Learners (N=39)	
	Mean	p-value	Mean	p-value	Mean	p-value
Basic Mode v.s. Preference Mode	4.43/4.83	0.108	3.94/4.39	0.127	4.69/6.08	0.000***
Basic Mode v.s.Internet Dictionary	4.43/4.10	0.280	3.94/4.33	0.407	4.69/4.38	0.352
Basic Mode v.s. Traditional Dictionary	4.43/3.23	0.000***	3.94/3.00	0.028*	4.69/2.77	0.000***
Preference Mode v.s. Internet Dictionary	4.83/4.10	0.005**	4.39/4.33	0.862	6.08/4.38	0.000***
Preference Mode v.s. Traditional Dictionary	4.83/3.23	0.000***	4.39/3.00	0.000***	6.08/2.77	0.000***
Internet Dictionary v.s. Traditional Dictionary	4.10/3.23	0.005**	4.33/3.00	0.000***	4.38/2.77	0.000***

* p<0.05 **p<0.01 ***p<0.001

Figure 2. The summary of experiment results

On the other hand, two navigational modes are designed in MyEVA to examine the effects of preference strategy setting: 1) Basic mode: system is freely opened for students to learn the words and use diverse VLSs. 2) Preference mode: students can set the most favorite learning strategy for the word and the system will show the preference strategy by default when they navigate the word every time.

2. Experiments and Data Analysis

The focus of the study is to determine whether mixed-modality VLS applied on e-learning system has a significant effect on L2 vocabulary retention. Four types of learning activities were conducted: basic mode of MyEVA, preference mode of MyEVA, internet dictionary, and traditional dictionary. In this within-subjects design, all 93 participants practiced the same 24 target words. However, the words were divided into four equivalent groups (A, B, C, D) of six words each, and subjects practiced each group of words under one of the four learning activities. The learning activity was randomly assigned to each group and each subject practiced all groups in the experiments.

This study used the selecting policy of target words with reference to the Folse's research (2006). The main concern in selecting the target words for the experiments was that they be unknown to the subjects. Totally 36 words in the within-subjects design were used and 24 of the words are actual target words. Three-level VKS was used for both pretest and posttest to detect even partial gains in degrees of knowledge. Each word could receive a score of 0, 1, or 2.

To analyze the data collected from the tests, an independent two-sample t-test was performed to determine whether the pretest and posttest exhibit significant differences in learning achievement (at the 95% confidence level).The t-test results showed significant differences between the pretest and posttest (t=18.27, p<0.001). The mean scores of pretest

and posttest were 1.06 and 16.61. An advanced observation divided the subjects into good learners (top 40% subjects getting higher scores in pretest, N=39) and poor learners (N=54), and compared the learning outcomes by different learning activities. The results are shown in Fig 2. 1) Overall: preference mode performed the best learning outcomes for L2 students (M=4.83). Both basic mode and preference mode had significant learning effects than internet dictionary and traditional dictionary. However, there were no significant differences between basic mode and preference mode (p=0.108). 2) Poor learners: preference mode performed the best learning outcomes (M=4.39). Internet dictionary (M=4.33) and basic mode (M=3.94) also performed good learning outcomes. However, there were no significant differences between preference mode, basic mode, and internet dictionary. 3) Good learners: preference mode performed the best learning outcomes (M=6.08) and had significant differences compared to the basic mode, internet dictionary, and traditional dictionary (p<0.001); nevertheless, there were no significant differences between basic mode and internet dictionary (p=0.352).

3. Conclusion

This study analyzed if four vocabulary learning tools have different effects on vocabulary retention for L2 students. The results showed that mixed-modality VLS with preference strategy setting (preference mode) stimulates the best vocabulary retention. Findings also indicated that subjects with different prior knowledge performed distinct learning outcomes. Mixed-modality VLS without preference strategy setting (basic mode) had the similar effect with internet dictionary on poor learners. It seems that good learners are aware of using preference strategy and achieve more effective vocabulary retention. The researchers believe the experimental results will have insight into language teachers, curriculum designers, and, in particular, system developers of English e-learning systems.

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