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VLASTWA: a vocabulary learning and strategy teaching web-app

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Abstract. This research study tends to evaluate the efficaciousness and usability of a Vocabulary Learning And Strategy Teaching Web-App (VLASTWA) – a customised and targeted web-app for (1) teaching the KeyWord Method (KWM) which is a widely investigated vocabulary learning strategy, and (2) facilitating new vocabulary learning via KWM. In this experimental study, with a between/within design, native Persian participants (n=160, age:18-60) learnt to use KWM, applied it in acquiring 22 new words, and tested this newly learnt vocabulary immediate (T1)/delayed (T2) recall. The effectiveness of the use of KWM taught within the web-app and the traditional Pen and Paper (P&P) in the experimental groups were compared with the control app and P&P groups via immediate/delayed recall of learnt vocabulary. The results suggest VLASTWA was efficient for learning new vocabulary while highlighting how meaningful and interactive it can be in accompanying and enriching Foreign Language (FL) vocabulary learning.

Keywords: keyword method, explicit strategy instruction, vocabulary learning, CALL, computer assisted instruction.

1. Introduction

Learning vocabulary, essential in FL mastery, is prolonged with restricted class contact time in formal education. Thus, students are often expected to acquire vocabulary in their own time. Described as a two-step strategy, the mnemonic

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How to cite: Mirzaei, S., Lewis, T. W., Wyra, M., & Wilkinson, B. (2020). VLASTWA: a vocabulary learning and strategy teaching web-app. In K.-M. Frederiksen, S. Larsen, L. Bradley & S. Thouësny (Eds), *CALL for widening participation: short papers from EUROCALL 2020* (pp. 240-246). Research-publishing.net. https://doi.org/10.14705/rpnet.2020.48.1195

KWM is one of the most useful approaches for vocabulary learning (Atkinson, 1975; Beaton et al., 2005; Wyra, Lawson, & Hungi, 2007). Firstly, for acquiring a new to-be-learnt FL word and its meaning, an association between the FL word and a known word in the learner's native language (L1) is identified and created by the learner; a (key)word with orthographic and/or acoustic alikeness to the FL word. Secondly, a mental image is made by the learner in which the keyword interacts with the meaning of the FL word. Acquired by students simply while being enjoyable, KWM is found to be effective in learning a considerable number of words and for long-term recall (Wyra et al., 2007).

A gradual shift has been noted from the focus on new technologies as tools for content mastery (e.g. vocabulary glosses) and skill practice to interest in pedagogy of the use and with the use of new technologies. A literature search for reports of an app designed to teach KWM as a strategy and to use it in KWM vocabulary learning has not yielded any findings. For this study, a web-app was designed and developed to (1) teach KWM strategy to adapt KWM requirements of explicit strategy instruction, and (2) teach/test vocabulary, with four sub-sections of (1) authentication, (2) vocabulary teaching, (3) vocabulary testing, and (4) the distraction game. Various custom-made algorithms were applied to map from the P&P to the app method accordingly.

In VLASTWA's design, existing literature in User Experience (UX) and User Interface/Interaction (UI) was taken into consideration; Nielsen's (1994) usability attributes of *efficiency*, *satisfaction*, *learnability*, *memorability*, and *recovery from errors* were combined with Harrison, Flood, and Duce (2013)'s *cognitive load* to avoid any technology/pedagogical disadvantages. For UX design of VLASTWA, Nielsen Norman Group's features of "meeting the exact needs of the customer" and "enforcing simplicity and elegance" were considered (Mirzaei, Wilkinson, & Wyra, 2018, p. 686). In UI design, Garrett's (2010) strategy of embedding suitable interface elements to encourage user task(s) accomplishment was applied.

To avoid cognitive overload, a simple interface with standard buttons/texts was used. Various factors including consistency, utility, style of text, arrangement, font size (visual hierarchy), spacing and typography, colour and colour contrasts, and texture/shapes were reviewed to increase the app's learnability and usability. VLASTWA's UI encouraged obvious feedback to allow comprehensive and consistent user direction/navigation via the workflow sequences. As shown in Figure 1 below, the layout of each app section stayed the same throughout the app.

Figure 1. Vocabulary teaching, vocabulary testing, authentication, and distraction game sub-sections (left to right)

2. Method

The pedagogical principles to reinforce explicit strategy instruction in this study were acquired from Wyra et al. (2007). Conducted under Flinders University Social and Behavioural Research Ethics Committee approval (SBREC, Project ID: 8374), this study aimed to evaluate the efficaciousness and usability of using computer devices to learn a vocabulary learning strategy (KWM) to learn new vocabulary (Persian/English) and to test vocabulary recall. For P&P groups, two booklets were designed, one to teach the words and the other to test recall on taught words via a bidirectional retrieval questionnaire. The syllables and part of speech for all the selected vocabulary items were similar (2-3 syllables concrete meanings nouns). Only experimental groups (app and P&P) were provided with KWM strategy training. The strategy training (encoding instruction) had explicit instruction, modelling, practise, and applying/learning phases followed by a chit-chat distraction. Table 1 shows the experimental study design. Based on Mirzaei (2016), both KWM training (1.2) and vocabulary learning/teaching (2.1) were separated in the study design so that KWM explicit instruction vocabulary learning/testing requirements could be met.

For the distraction in 2.2, a simple chit-chat and a low-cognitive within-the-app game were utilised for P&P and app groups, respectively. In Phase 3, the same words and their meanings were used (22 word-pairs) to befit the study purpose of learnability/usability testing of the web-app for KWM employed in FL and L1 contexts. The designed web-app stuck to identical routines of the P&P KWM approach, with some additional app features: (1) illuminating the keyword while showing the word-pairs in a timely manner (word-word meaning-keyword in

chronological order); and (2) showing a bar timer to indicate the remaining time to learn the word-pairs.

Table 1. Experimental study design (n=40 for each group)

Days	Phase	Descriptions	Control		Experimental KWM	
			P&P	App	App	P&P
1-4	1.1	Background questionnaire	√	√	√	√
1-4	1.2	Encoding instruction	X	X	√	√
1-4	1.3	Distraction	√ (Chat)	√ (Chat)	√ (Chat)	√ (Chat)
1-4	2.1	Learning 22 words (7.5 mins)	√	√	√	√
1-4	2.2	Distraction	√ (Chat)	√ (Game)	√ (Game)	√ (Chat)
1-4	3.1	Test 1 (T1) – 22 words (5 minutes)	√	√	√	√
5-8	3.2	Test 2 (T2) – 22 words (5 minutes)	√	√	√	√

3. Results and discussion

To investigate learnability/recall, a mixed design ANOVA with repeated measures was conducted to compare the immediate (T1)/delayed (T2) recall (Table 2).

Table 2. Immediate (T1)/delayed (T2) recall (* indicates significance - P&P/app: $p<.002$)

Treatment	Method	Time	Mean	SD	n
Control	P&P	T1	9.200	2.729	40
		T2	8.125	2.848	40
	App	T1	10.075	2.795	40
		T2	9.575	2.791	40
Experimental KWM	P&P	T1	13.625*	1.628	40
		T2	12.650*	1.929	40
	App	T1	14.325*	1.886	40
		T2	14.150*	1.331	40

Results indicated that the experimental groups' participants had better performances when recalling the new words in T1 and T2 than the participants from the control group in T1 and T2 ($p<.002$). The experimental KWM app group had the highest number of correct recalled words between all groups with 14.3 (65%) immediate

recall and 14.1 (64%) delayed recall. The number of correct words in delayed recall reduced in all groups while both experimental groups had the least decrease, with less than one word. Figure 2 and Figure 3 show the number of words recalled in immediate/delayed recall for control/experimental P&P and app groups, respectively.

Figure 2. Immediate (T1)/delayed (T2) recall by treatment for P&P (p<.002)

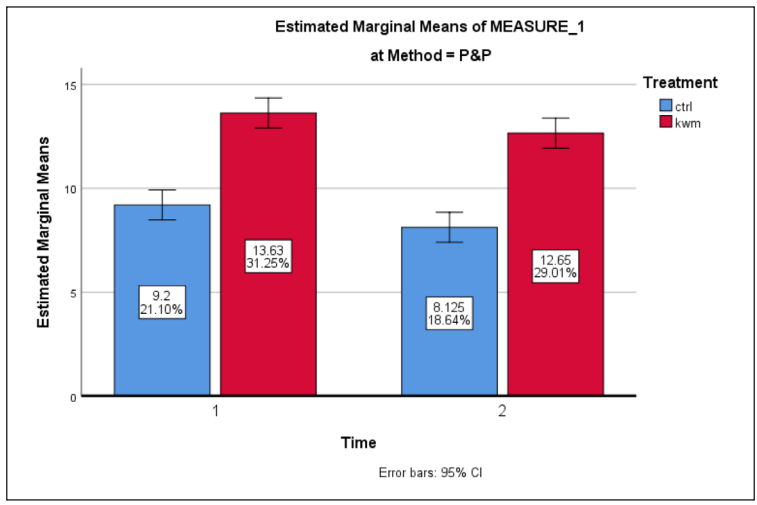
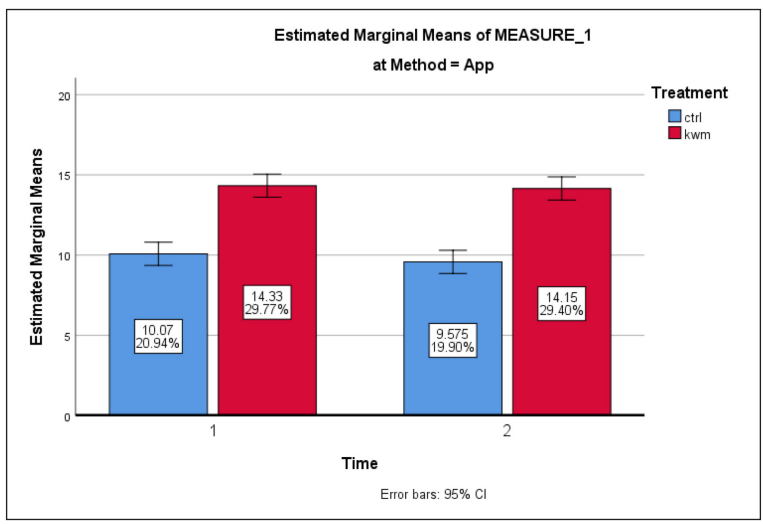


Figure 3. Immediate (T1)/delayed (T2) recall by treatment for app (p<.002)



4. Conclusions

A comparison of the experiment's collected data indicated that use of the web-app for vocabulary acquisition with KWM not only bestows the same vocabulary learning effectiveness but also gives a significant advantage in learning vocabulary. The conducted experimental research revealed that KWM can be easily embedded in the web-app from learnability and pedagogical perspectives and the web-app can be utilised as an effective apparatus in learning new words. However, as this is the first investigation of its kind, future design, development, and experimental studies are required to augment the prospective use of the web-app for further studies with different populations of young children to adults, disparate word sets/languages, and different technologies (augmented/virtual reality).

5. Acknowledgements

We would like to express our gratitude toward the two overseas institutions and the participants involved in the experiment. Also, we would also like to thank Flinders University College of Science and Engineering for providing the required funding.

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Published by Research-publishing.net, a not-for-profit association
Contact: info@research-publishing.net

CALL for widening participation: short papers from EUROCALL 2020
Edited by Karen-Margrete Frederiksen, Sanne Larsen, Linda Bradley, and Sylvie Thouësny

Publication date: 2020/12/14

Typeset by Research-publishing.net
Cover theme by © 2020 Marie Flensborg (frw831@hum.ku.dk), based on illustration from freepik.com
Cover layout by © 2020 Raphaël Savina (raphael@savina.net)

ISBN13: 978-2-490057-81-8 (Ebook, PDF, colour)

British Library Cataloguing-in-Publication Data.
A cataloguing record for this book is available from the British Library.

Legal deposit, France: Bibliothèque Nationale de France - Dépôt légal: décembre 2020.