LEVERAGING THE AFFORDANCES OF MOBILE LEARNING FOR VOCABULARY GAINS

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ABSTRACT

According to research findings, learners who are about to commence an undergraduate degree course with English as the medium of instruction (EMI), require a minimum English vocabulary size in order to decode and comprehend the academic texts that they have to read (Hazenberg and Hulstijn, 1996; Staehr, 2008; Laufer and Ravenhorst-Kalovski, 2010; Schmitt, 2010; Nation, 2013, Milton and Treffers-Daller, 2013). In the United Arab Emirates, several thousand Emirati students attend English foundation programmes prior to starting their EMI degrees in order to improve their academic skills, such as reading and vocabulary knowledge. However, despite the increased use of Technology-Enhanced Learning (TEL) and the introduction of mobile learning in 2012, the results of this study show that the vast majority of female Emirati still have an insufficient receptive vocabulary size for beginning an EMI undergraduate degree course. In addition, the use of a generic vocabulary learning app over a four-month period has not led to a significant increase in most students' vocabulary size. The reasons for this could include the fact that the generic app does not fully utilise the affordances of mobile learning, it is not underpinned by pedagogically-sound vocabulary learning principles and that it does not focus on the particular learning needs and lexical weakness of Emirati students. Therefore, the author has worked as part of a team to develop and build a new, customised, mobile app that has attempted to address these weaknesses and help Zayed University students reach the required vocabulary learning goal.

KEYWORDS

Foreign languages; vocabulary; apps; affordances; mobile learning; adaptive learning

1. INTRODUCTION

The ability to read academic texts is important for all students in higher education, but it is a particular issue for students for whom English is not their first language and who are about to embark on an EMI (English as the medium of instruction) undergraduate degree course. In order to read and understand these academic texts, it is important that students possess a sufficient knowledge of the appropriate English vocabulary or lexical items so that they can recognise and decode the words on the page. Several studies show that learners require a receptive knowledge of at least the first 3,000 most frequent word families in order to understand these texts with the help of an instructor (Nation, 2013: 208).

In order to achieve this learning goal of 3,000 word families, students need to actively learn and practice the most frequent words families in English (Nation, 2013). An ideal tool to do this a vocabulary learning app on a mobile device, such as a tablets or smartphone. This takes advantages of many of the affordances of mobile technology, such as ubiquitous learning, multimodal meaning, recursive feedback and differentiated learning (Cope & Kalantzis, 2017) and navigationism (Moran, 2008).

At Zayed University in the UAE, these affordances have been harnessed to develop a context-specific, vocabulary learning app that supports learners in acquiring 600 of the most useful and frequent general and general academic word families in English. This paper first identifies the issues as described in the literature, as well as the learning context. It then describes how the features of the new app leverage the affordances of e-learning and mobile learning, and finally how these features are based on key pedagogical principles and process of learning vocabulary.

ISBN: 978-989-8533-68-5 © 2017

2. LITERATURE REVIEW

2.1 Conceptualising Vocabulary

Vocabulary knowledge in any language can be conceptualised in terms of breadth or depth. Vocabulary breadth, or vocabulary size, refers to the number of words or word families a person knows, while vocabulary depth refers to how much a person knows about each word (Milton, 2013, p. 60). Another important distinction is between the written or orthographic form of a word that is used in reading and writing and its aural or phonological form used in listening and speaking (Nation, 2013).

2.2 Vocabulary Size

There is already a clear relationship between reading comprehension and breadth of receptive vocabulary knowledge in a language. Nation (2013: 208) states that knowledge of the 3-4,000 most frequent word families in English will enable readers to recognise and comprehend 95% of the words in most written texts with instructional support from the teacher. However, in order to read and understand most texts independently of a teacher, and be able to guess the meaning of the remaining unknown words, learners need to know 98% of the words in a text. This is equivalent to knowledge of 8-9,000 word families (Ibid). This is supported by Laufer & Ravenhorst-Kalovski (2010:15), who also identified 8,000 word families as an optimal size for reading comprehension.

2.3 Learning Context

Zayed University is one of three federal higher education institutions in the United Arab Emirates in which English is the medium of instruction (EMI) on all degree courses. Prior to starting their 4-year degree course, students with a lower level of English ability have to join a foundation program for a maximum of eight months over one academic year of two semesters. On this program they undertake intensive English for General Academic Purposes (EGAP) courses of up to twenty hours per week in order to gain the necessary English language and academic skills. Technology is widely used throughout the program, both in terms of the hardware and software. Since August 2012, the use of iPads was mandated in all classes and they became the primary tool for the students to consume and produce learning content. Students also make use of their smartphones for certain learning tasks and activities. For each of the three levels in the Foundation program, there are clear vocabulary learning objectives that focus on receptive vocabulary knowledge. The learning outcome is for students to learn 600 word families over a period of 16 weeks.

2.4 Current Vocabulary Knowledge

At the end of the 2016 Fall semester, 252 students in the final level of the foundation program completed an online vocabulary size test. The results showed that nearly 50% of the students had a receptive vocabulary size of only 2,000 word families, while approximately 24% of students had a vocabulary size of less than 2,000 word families. Only 14% of students at the end of the ABP demonstrated a vocabulary size of 3,000 word families, which has been identified as an absolute minimum for starting a degree course in English.

2.5 Mobile Apps for Learning Vocabulary

Since the introduction of mobile devices, such as tablets and smartphones, a plethora of commercial mobile apps have been developed that support the learning of different aspects of vocabulary in various languages. These include those that focus on general language development (Duolingo), storing vocabulary (MyWordBook) and retrieving vocabulary (Quizlet).

In addition, there have been several attempts by teachers and academics to develop English vocabulary learning mobile apps for their particular learning context and their research findings show how mobile learning apps can enhance English vocabulary learning. For example, Wu (2015) reports on the development

of a Basic4Android smartphone app to help college students in China improve their English vocabulary. She shows that the students who used the app "significantly outperformed those in the control group in acquiring new vocabulary" (2015: 170). Similarly, Wang (2017) designed an Android app that presented 720 lexical items from the New General Service List (NGSL) of the most frequent words in English to her class of university students in Taiwan. Feedback from her students suggested that for the vast majority, the app gave them more opportunities for learning English and allowed them to learn every day.

2.6 Generic Vocabulary App

In terms of the Foundation program Zayed University, a generic, off-the-shelf app and website – 'Vocabulary and Spelling City', was introduced at the beginning of the 2015 academic year as a way for students to try and learn the 600 word families specified in the curriculum.

In order to measure the effectiveness of the app, students were asked to complete an online vocabulary size test at the beginning of the Fall semester in September 2016 and again at the end of the semester in early December 2016. The test scores are presented as knowledge of vocabulary in bands of 500 word families. Table 1 shows the changes in the overall vocabulary band scores for the 212 students who completed both tests. 103 or nearly half of all the students showed no change in the size of their vocabulary, as measured by the test. 56 students or about a quarter of the total increased their vocabulary by one band and 22 students or 10% of the total increased it by two bands. At the other end of the scale, 23 students or 10% of the total experienced a decline in their receptive vocabulary by on band.

Table 1. Changes in Vocabulary Sizes for EGAP4 students between Sept. and Dec. 2016

Change in Band Scores	Number of students	Percentage of total number of students
Decreased 3 Bands	1	0.47%
Decreased 2 Bands	6	2.83%
Decreased 1 Band	23	10.85%
No Change in Band	103	48.58%
Increased 1 Band	56	26.42%
Increased 2 Bands	22	10.38%
Increased 5 Bands	1	0.47%
TOTALS	**212**	**100%**

Overall, the learning gains from using the generic vocabulary app have been far from impressive. There could be several reasons for this. Firstly, the generic app does not fully utilise the affordances of mobile learning. Secondly, it is not underpinned by sound vocabulary learning principles. Finally, it does not focus on the particular learning needs and lexical weakness of Emirati students. Therefore, the author has worked as part of a team to develop and build a new, customised, mobile app that has attempted to address these weaknesses and help Zayed University students reach the required vocabulary learning goal.

3. AFFORDANCES OF A CUSTOM-BUILT APP

The Academic Vocabulary App (AVA) was designed by instructors in the foundation program in conjunction with instructional designers from the university's Centre for Educational Innovation (CEI). All the content was localized for the context and it has been designed to take advantage of many of the affordances advocated by leading educationalists in e-learning, such as Cope & Kalantzis (2017).

3.1 Ubiquitous Learning

The app is primarily designed to be used by the learners as a self-access tool outside the classroom, using their smart phones or tablets. Learners can take advantage of the anytime, anywhere, anyhow aspect of mobile learning and are actively encouraged to use the app whenever they have even five minutes of free time. Instructors can also make use of it in class to play team games to review word families.

3.2 Multimodal Meaning

As well as static text and images, the app also uses sound files to allow users to hear each word being pronounced by a speaker of either British or American English. This allows users to make a much stronger connection between the orthographic (written) representation and the phonological (aural) representation of the meaning.

3.3 Differentiated Learning

In order to take advantage of the ability of the technology to differentiate learning for each individual, AVA features elements of individualized and adaptive learning. Firstly, items within each stage are completely randomized, so no two learners will get the same sequence of items. In addition, if a user gets an item wrong, it is re-presented later within the same stage. Finally, the app records which words and items a user has had problems with and saves these as Weak Words. Users can then complete Weak Word Quizzes that only contain items for these words.

3.4 Recursive Feedback

At all stages, feedback is constant and immediate. For individual items, users get instant feedback on whether their answers are correct or not. If they are incorrect, they get the opportunity later to answer the same question again. At the end of each Stage, block and Unit, users get feedback on which words were weak and are directed to complete extra activities to strengthen these.

3.5 Navigationism

Finally, the structure of the app has been designed so that learners can follow the built in learning sequence to maximize learning gains or, if they prefer, go to the Stages in the app that they feel they need more practice with, such as learning collocations. This encourages learners to develop their skills in navigationism (Moran, 2008) so that they can steer their own path through the learning materials without a teacher being there to dictate their learning pathway.

4. VOCABULARY LEARNING PRINCIPALS

AVA is also based on four important vocabulary learning principles or processes that make it unique amongst mobile vocabulary learning apps.

4.1 Noticing

This process simply refers to learners giving attention to a particular word or lexical item. In the app the meaning and form of each new word is presented very clearly in the initial stage so that users can connect the two in several different activities.

4.2 Encoding

Encoding is the process by which a new trace of information is laid down in memory. According to Kihlstrom (2013) a stronger memory is created “when we process an item deeply, connecting it to our rich fund of pre-existing knowledge.” (Kihlstrom, 2013, p. 3). AVA incorporates this principle by presenting new words in sentences that are localized and relevant to Emirati learners. This makes them more meaningful and therefore more likely to be remembered.

4.3 Generating

Previously met words need to be subsequently used in ways that are different from the previous meeting with the word (Nation, 2013, p. 68-72). These new meetings force learners to reconceptualise and strengthen their knowledge of that word within their long-term memories. In AVA, there are six different stages that users can pass through and each one focuses on a different aspect of vocabulary, including spelling, collocations and word families. Each stage enables users to see the same words in different contexts, which are more likely to help preserve and enhance the long term memory trace of that word.

4.4 Retrieving

This final process involves actively remembering and recalling the form and meaning of a word at different points (Nation, 2001, p. 66-68). To maximize the effectiveness of retrieval, learners require at least seven opportunities to retrieve the word from their memory (Nation, 2001:67). Within each block of 10 words in AVA, users encounter each word at least 10 times over a 30-minute period.

5. CONCLUSION

As has been described in this paper, the development of a custom-built, vocabulary learning app has been based on substantial research into both the affordances of e-learning and mobile technology, as well as key vocabulary learning principles. For the Fall 2017 semester, all learners in the final level of the program will use the app for the first time and a measurement of their vocabulary sizes will be taken at the beginning and end of the semester. It is hoped that the consistent use of the app by learners on the foundation program will lead to a greater number reaching the learning objective of 3,000 of the most frequent word families in English and, therefore, being better able to cope with the academic texts they are required to read on their EMI undergraduate courses.

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