



Using Mobile Vocabulary Learning Apps as Aids to Knowledge Retention: Business Vocabulary Acquisition

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Introduction

In recent years, mobile technologies have begun to offer pedagogical affordances that promote meaningful learning, especially in vocabulary acquisition, both inside and outside the classroom (Chai, Wong, & King, 2016; Duman, Orhon, & Gedik, 2014; Liu, 2016). Vocabulary knowledge is perhaps the most important component for foreign and second language learners in higher education surroundings (Chen & Chung, 2008; Huckin, Haynes, & Coady, 1993), as vocabulary is one of the building blocks of a language (Nation, 2001). Previous researchers have found that second and foreign language learners struggle with learning and memorizing vocabulary (Oxford, 1990; Schmitt, 2010). Consequently, it is vital to provide learners with an effective learning tool to facilitate their vocabulary acquisition.

Mobile assisted language learning has proven itself a capable educational tool to aid the retention of newly acquired language using ubiquitous learning (Chinnery, 2006; Hwang & Chang, 2011; Hwang & Tsai, 2011). Among the various mobile assisted language learning technologies available, smartphones have perhaps the highest potential for enhancing the educational process and creating interesting, motivating, stimulating and unconventional learning opportunities (Cui & Bull, 2005). This has led to a drastic increase in available vocabulary applications that may help foreign and second language learners to acquire vocabulary knowledge. It is with this background that we developed the in-house mobile application, *Excel@EnglishPolyU*, specifically to help Hong Kong University students with business vocabulary.

This article is a preliminary attempt to examine the effects of the app to enhance undergraduate students' knowledge retention of business vocabulary of different difficulty levels through extended ubiquitous learning opportunities. The guiding questions are:

1. Can the mobile assisted language learning app enhance learners' retention of business vocabulary of different difficulty levels?

2. To what extent can the mobile assisted language learning programme enhance learners' retention of business vocabulary of different difficulty levels?

Literature Review

Vocabulary Knowledge Retention

Vocabulary acquisition is an essential component within the language learning framework, and the most widespread source of difficulty among language learners (Ali & Ghazali, 2016; Viberg & Grönlund, 2013). Based on the literature, there are two major approaches to effective retrieval and long-term retention of vocabulary items. One is multimodal presentation, which displays word knowledge in multiple media forms. According to the cognitive theory of multimedia learning (Mayer, 2005; Mayer & Moreno, 2003), word knowledge develops through two channels: visual and aural. When learners see word knowledge in multimedia forms, it stimulates and uses both channels, and it establishes connections between knowledge forms and their storage in memory, thereby facilitating learners' memory retention and expediting their knowledge retrieval (Chun & Plass, 1996). The other is spaced repetition: a programmed system providing a series of presentations and exercises of word knowledge, which is a particularly important approach to maximizing learners' exposure to lexical terms, deepening their understanding and elongating their knowledge retention (Schmitt, 2010). Wozniak and Gorzelanczyk (1994) and Thalheimer (2006) argued that the repetition intervals between knowledge presentations should be as long as possible so long as learners still retain the knowledge; Nation (2001) postulated that the optimal number of repetitions should range from five to seven, and Nation argued that educators should personalise the repetition method and adapt it to the levels and preferences of individual learners.

The spotlight of this study is on the increasing integration of multimedia technology into mobile learning (Alseghayer, 2001; Joseph & Uther, 2009; Yeh & Wang, 2003; Zarei & Khazaie, 2011), its wide accessibility without traditional constraints of time and space (Chookaew, Wanichsan, Hwang, & Panjaburee, 2015) and the likelihood that it can have a facilitative effect in enhancing learners' word knowledge retention.

Mobile Language Learning

In the literature, there has been acknowledgement of the benefits of mobile applications for language learning (Burston, 2014; Godwin-Jones, 2011; K. Kim & Kwon, 2012; Lafford, 2011) based on their potential to engage students in activities to learn, practice and enhance their overall language proficiency. However, as with most language learning resources, the features and potential of apps are quite varied. This has led to criticism that has challenged the match between pedagogical and technical qualities, and researchers have claimed they might only deliver fragmented learning practice (Pareja-Lora et al., 2013). Another criticism is that educational apps can be quite basic, and they generally imitate what others have accomplished previously with other technologies (Burston, 2014). Whilst it is arguable whether apps can offer a concrete answer to language learning, apps could provide a supplement and a starting point for learners (Rosell-Augilar, 2018).

Many researchers have investigated the implementation of mobile learning in educational contexts, and they have found generally positive attitudes from students (Castañeda & Cho, 2016; Dashtestani, 2016; D. Kim, Rueckert, Kim, & Seo, 2013). Specifically, if the applications incorporate user-friendly experience, touchscreen function, flexibility and ability to personalize learning, students respond well (Zou & Li, 2015). Mason and Zhang (2017), in their study on Chinese learners, discovered that 132 of 140 learners of Chinese utilised apps autonomously and found that the apps supported their language acquisition; however, the learners only used some of the available functions. Accordingly, Stockwell and Hubbard

(2013) called for additional studies into how students actually use the apps and how this might differ from the original intentions of the app designers/developers.

In recent studies, a consensus has emerged that mobile-assisted vocabulary learning leads to increases in students' vocabulary accuracy (Castañeda & Cho, 2016; Sandberg, Maris, & Hoogendoorn, 2014), and that it can enhance students' vocabulary acquisition and reduce "the burden of memorization" (Wu, 2015, p. 176). Moreover, some have found the effectiveness of apps comparable to face-to-face teaching (Rachels & Rockinson-Szapkiw, 2017), and researchers have found improvements in vocabulary acquisition (Steel, 2012; Yıldız, 2012). Calvo-Ferrer (2015) found that applications are highly effective tools for foreign and second language learners to acquire new vocabulary.

The present study investigated the facilitative effect of mobile vocabulary learning programmes in improving learners' knowledge retention in their learning of discipline terms – business vocabulary.

Method

The researcher produced an app, *Excel@EnglishPolyU*, and two vocabulary-based English language learning games: *Alphabet vs. Aliens* and *Books vs. Brains@PolyU*, through which learners could acquire vocabulary knowledge by completing level challenges.

The research took place in autumn 2018 with 51 undergraduate students who were 19-23 years age at a university in Hong Kong. All participants were native Chinese speakers with English as a second language, and they were of homogenous cultural and educational backgrounds. We first measured participants' vocabulary capabilities with pretests, in which they had to choose between "Yes" and "No" as their answers to 120 questions, such as "Business – do you know the word?" Then they learned four groups of 30 business vocabulary items through the two games on the app. To study their retention of the newly learnt vocabulary knowledge, the participants took posttests one month later, with the same questions as in the pretests.

The target words fell into four difficulty levels – beginner, elementary, intermediate and advanced. There were 30 words per level, 120 in total, with which the 120 questions on pre- and posttests corresponded.

We used Google Forms to collect and code participants' performances in the pre- and posttests. We used a quantitative study to elicit data for analysis regarding the mobile app's effect on enhancing students' discipline-specific vocabulary.

Results and Discussion

In the pre-test of business vocabulary at the beginner level, an average of 46.23 participants acquired every word, with the lowest performers acquiring only 13 out of 30. The word the fewest learned was "ballot," with only 15 of the participants recognising it. One month after learning through playing the games, all the post-test participants recognised 20 words. All the 30 terms had more recognition from the participants. The word "ballot" remained the lowest in terms of student recognition, but 20 more participants acquired it. The average number of capable participants for each word in the post-test was 48.90, up by 2.67 (5.24%) from the pre-test.

As for the elementary vocabulary, an average of 44.19 pre-test participants recognised each word, with all participants recognising 14 of the 30 words. Only three participants had confidence in their knowledge of the term "monetization." One month after playing the games, the average number rose by 2.13 (4.18%) to 46.32. The number of students who acquired the word "monetization" increased to 12. Generally, post-test participants remembered more words at the elementary level – especially the word "downsizing," which 18 additional participants acquired. The word "quarter" proved to be the exception, with three fewer participants remembering the word.

At the intermediate level, an average of 41.32 participants knew each word. All participants recognised just six words, while only 12 participants understood “venture capital” and “unanimous”. In the post-test, 15 more students had acquired the words “unanimous” and “speculate”, while nine more students had acquired the phrase “venture capital”. The average number of post-test participants who knew each word was 46.13, up by 4.81 (9.43%) from the pre-test.

As for the business vocabulary at the highest level, the average number of proficient participants for each word was 31.90 in the pre-test, with all participants recognising only five words. Only two participants knew “consortium” and “force majeure”. In the post-test, the average number who knew each word rose by 3.52 (6.90%) to 35.42, with those knowing the phrase “legal tender” increasing from 19 to 37. Most participants knew more words, except “irrevocable” and “yield” (see Figure 1).

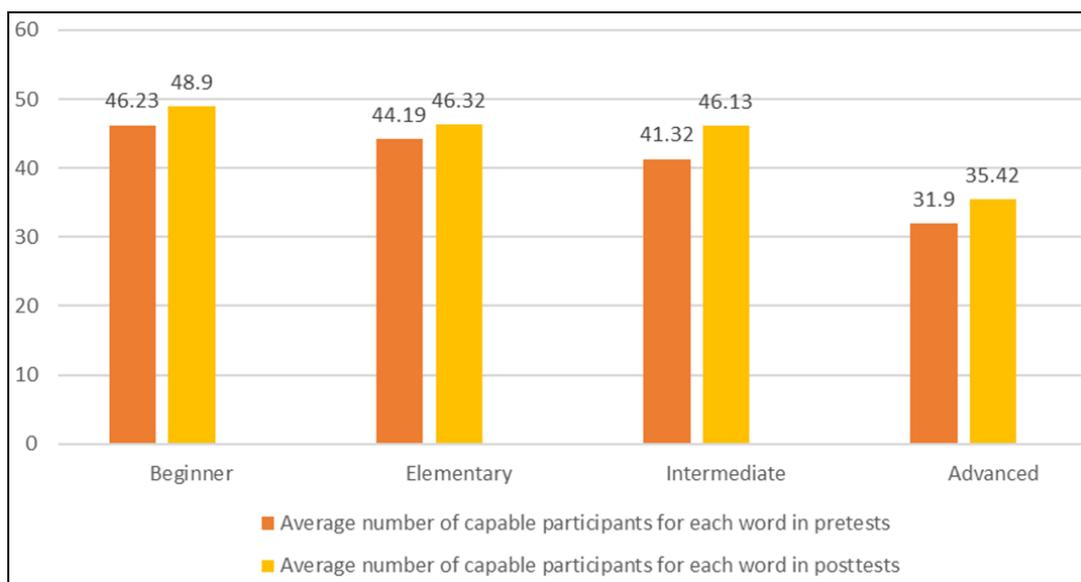


Figure 1. Vocabulary abilities at the four levels in pre- and posttests.

On a global view, it is apparent that the words on higher levels are more difficult for participants to recognise in both the pre- and post-tests: there were 14.33 and 13.48 more participants respectively on average with full knowledge in the pre- and post-tests at the beginner level of vocabulary than those at the advanced level. This result coincided with Breland’s (1996) study of word difficulty.

Another noticeable fact was the increased number of proficient participants in the post-tests at all levels. All the 120 words had on average 3.28 (6.44%) more recognition from participants one month after playing the game – which provides convincing evidence of the facilitative effect of the mobile vocabulary learning programme, as well as an aid in enhancing learners’ knowledge retention. This increase was particularly prominent when it came to words that received very low recognition in the pre-tests, such as “ballot” and “unanimous”.

Generally participants seemed to learn and remember vocabulary better at the higher levels than the lower ones, which, on one hand, might be due to the already high levels of acquisition of the beginner- and elementary-level words in the pre-tests, and, on the other hand, could suggest that learners paid more attention to the learning and testing of difficult words than easy ones; learners tended to focus more and to make more progress in learning when they felt appropriately challenged during the process (Chen, Lee, & Chen, 2005; Masrai & Milton, 2015). As for the lower number of participants who knew certain words in the post-tests, a possible explanation is that participants might have mistaken words they actually did not know for those they had already acquired, and they might have chosen “Yes”; after their learning through the app, however, it is possible that they still failed to remember the exact meaning of these words, but they may have realised that their original understanding was wrong and chosen “No” instead.

Conclusion and Future Studies

The preliminary findings of this study illustrate that mobile gamified educational programmes are a fruitful avenue for students to expand their business vocabulary knowledge and retention. In future studies, we will further evaluate and explore the effectiveness by expanding the sample size, investigating the vocabulary learning of other disciplines, and researching participants' sensory perceptions of mobile learning using qualitative methods.

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