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A Brief Comparison Of Digital- And Self-Made Word Cards For Vocabulary Learning

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Abstract

Learning L2 vocabulary is a difficult task due to L1 interference, lexical-knowledge, size, and acquisition method. Word cards, staple features of many teaching methods, are increasingly being digitised, becoming available on portable devices such as laptops and smart-phones. This paper seeks to conduct a small-scale investigation focusing on a short-term comparison between traditional and digital word-cards. A literature review will be conducted, and results will be discussed to provide insight into this new avenue of enquiry, as well as to suggest points for further investigation.

Introduction

As mobile, digital devices become increasingly incorporated into the daily lives of those in MEDCs, a growing number of research considers the use of this technology for educational purposes (Fujimoto, 2012; Levy, 2005; Lu, 2008; Stockwell, 2008; Tai, 2011). Due primarily to the prevalence of smart-phones and small tablet devices, the positive perception among second language (L2) learners of mobile devices as potentially viable for learning continues to improve (Fujimoto, 2012; Tai, 2011). L2 study in particular requires much time, effort, and attention to a number of facets. Among these facets, researchers suggest that vocabulary is of central importance, with many studies highlighting strong quantitative links between vocabulary knowledge and language skills (Schmitt, 2010: 4). Indeed, as commented by Wilkins, “without grammar little can be conveyed, without vocabulary nothing

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can be conveyed” (1972: 111).

Within the Mobile-assisted language learning field (MALL), research has been conducted concerning vocabulary study (Chen, 2008; Levy, 2005; Lu, 2008). However, although only separated by a 5 years, the majority of prior research focused on SMS-learning systems. Current mobile-digital devices, notably the “smart-phones” such as Apple iPhones and Android-OS phones, are able to use more tailored, stable and accessible applications – known as “apps” – which grant these digital devices greater utility. One such app, called Quizlet, permits the user to access a world-wide database of pre-constructed, customisable vocabulary flash-cards for study, essentially transforming the smart-phone into a digital flash-card set. This brief study will seek to quantitatively compare these digital word-cards with paper word-cards, and will additionally gather learners’ opinions regarding the use of their smart-phones for such language learning.

Literature Review

Literature covering vocabulary learning and acquisition is indeed numerous and covers a broad range of topics. A substantial amount of research has been conducted upon vocabulary research in general (Krashen, 1982; I. S. P. Nation, 1990, 2001, 2010; Schmitt, 1997, 2010; Wilkins, 1972), with more focused investigations into paper-flashcards for vocabulary learning (Horst, 2005; Mondria, 1994; I. S. P. Nation, 2001; P. Nation, 1997), as well as several enquiries in computer-assisted vocabulary learning (Chen, 2008; Groot, 2000; Lu, 2008; Nakata, 2008). However, online research database searches reveal few investigations into contemporary digital, mobile word-cards, their effects on L2 acquisition vis-a-vis paper-based cards or their reception by students (Başoğlu, 2010; Lu, 2008). Of these two studies, the older focuses on SMS-delivered word-lists, and while Başoğlu (2010) successfully compares the use of independently created vocabulary software on PDAs with the more traditional word-cards, the report concludes that the technology available at the time of the experiment limited its scope. As previously stated in the introduction, it is possible that the continued progression and expansion of mobile, digital technology could have produced more opportunities for L2 learners to utilise their phones for vocabulary learning purposes (Fujimoto, 2012: 193).

Learning vocabulary is in itself a difficult task, however. Extensive word-list vocabulary learning methods as evidenced in the Japanese education system, which are often non-contextual and designed for standardised exams such as 英検 (Eiken), TOEIC and the センター試験 (University Application Exam) (Chujo, 2004: 35), is not considered ideal by researchers (Krashen, 1989). However, Nation points out that while lists and word-cards should not form the sole vocabulary-learning system,

such methods are useful and can be made more effective through several guidelines (I. S. P. Nation, 2010). Chief among these are “L1 translations” (research concluded that L1–L2 pairs prove most effective); “retrieval” (actively try to remember an L2 word by looking at its L1 meaning); and “pronunciation” (pronouncing the words creates dual-coded pegs to make the words easier to remember) (I. S. P. Nation, 2010: 31). Word-cards continue to see use, primarily because they provide a large number of vocabulary items, in a short space of time, and they produce knowledge needed for everyday language use and tests. (I. S. P. Nation, 2010: 32).

The use of L1 translations for L2 lexical learning is considered of high importance (Schmitt, 2010: 25). L1–L2 word-cards can also support both “productive learning” and “receptive learning”; productive learning takes the L1 meaning and tests for L2 word knowledge, such as pronunciation, spelling and type, while “receptive learning” seeks the L1 meaning from the presented L2 word. Studies have found that paired-word learning, such as the sort done with word-cards, effectively results in both strings of knowledge (I. S. P. Nation, 2001: 33). This does not mean that vocabulary learnt using word-cards is not forgotten, for perhaps due to the sheer number of individual L2 words vocabulary knowledge quickly atrophies. Regular, repeated use of a set of words is required to keep the associated pairs current, although research has shown that previously learned words, though not encountered recently, are more quickly re-acquired than words being learned for the first time (Schmitt, 2010: 23). Schmidt also notes that along with focused attention, learners need to engage with the word many times in order to effectively acquire it. Engagement might cover simply viewing the word, looking up its meaning, writing it, and choosing it from among multiple options as in a test, and as far as possible a range of engagement activities should be sought (2010: 27). Indeed, making word-cards may also be held as a word-engagement activity, though whether the time spent making cards could be better spent on repetitions with pre-made cards has yet to be investigated (I. S. P. Nation, 2010: 42).

As mentioned before, Japan’s education system focuses mainly on preparing students for high-stakes placement, school-entry and qualification exams (Chujo, 2004; Sato, 2009). While many commentators argue that this should not be the case, it is, as Sato states, the reality in which EFL is conducted in Japan (2009: 13) (Sergeant, 2009). Also noted is the relatively small vocabulary size of Japanese EFL students when compared to other English L2 students, despite the lengthy hours of instruction (Schmitt, 2010: 9). Despite this, however, we should note that while Japanese EFL students face an unparalleled number of tests (Barry, 2004; Berwick, 1989), they for the most part continue to pour over word-lists, practice sheets and flash-cards until the test is complete (Berwick, 1989; Miura, 2010). Quantitative research suggests that students average 7–10 hours a week commuting

to and from school (Lees, 2013), and anecdotal evidence from many teachers will testify to their use of 単語帳 (word-books) and word-cards on the trains and buses.

It is quite possible that mobile learning on digital devices – to wit, the increasingly prevalent and increasing versatile smartphones such as the iPhone and the Android OS models – could prove an effective alternative in such an environment. Poulshock notes that these devices are widely owned, particularly among younger Japanese (2011: 55). Research in general shows that students generally view using their digital devices for mobile-assisted language learning (MALL) in a positive light (Fujimoto, 2012; Poulshock, 2011), though that they might become distracted (Stockwell, 2008). Indeed, Stockwell notes that learners' experience of a given technology in their own daily lives influences how they will view it as a learning tool (2007: 379). This sentiment is echoed in Philpott's report on autonomous learning technologies (2013: 34). Fujimoto's research into the use of mobile phones for language learning in Australia illustrates that few currently view such devices as learning tools, and that free-time word-card usage, at least on pre-smartphone models, remained low at only 5% of the survey sample (2012: 175). Concerning more qualitative approaches, both Chen and Başoğlu present research based on independently created vocabulary software on PDAs; Chen notes that learners engaged well with the mobile software (2008), and Başoğlu's research suggested not only that students responded positively to the digitised learning system, but also that digital word-cards were comparable in effectiveness to paper-based cards (2010: 4). Additionally, Başoğlu states that many students reported using their PDAs whilst commuting or waiting (2010: 5), which concurs with Fujimoto's findings that almost a third of mobile-device use is as a "time-killer" during down-periods (2012: 172).

In this brief literature review we have learned that word-cards, whilst occasionally rejected by educators, remain an important and effective method of vocabulary learning. Their L1–L2 translations provide a stable, pair-association link for acquisition purposes, and the physical functions support both receptive and productive learning patterns. While perhaps not as engaging as writing, reading or manipulating the words in context, word-cards are still able to provide engagement enough when used correctly, by recalling word-information such as spelling, category and pronunciation, as well as by constructing the cards themselves. The learners in question, tertiary-level EFL students in Japan, are familiar with both word-cards and the use of digital devices such as smartphones. Finally, while the volume of research is not conclusive, it seems to be held that contemporary learners view digital devices in a generally positive light, and will use them throughout their day-to-day lives when opportunities present themselves.

It is from this background that the following research questions will be posed:

1. How do the students' results of using a digital word-card program on a smartphone compare with the results of using paper word-cards?
2. What are the overall impressions and opinions regarding the use of digital word-cards as an alternative to paper word-cards?

In the next section I will introduce and briefly examine Quizlet, the software program which will be utilised in this study.

Digital Word-Cards

Quizlet (2007) is a computer-based online learning tool. Users create an account, and then are able to browse and use a myriad of user-created word-lists, modify them, or create their own from scratch. While the creation and customisation of these word-lists is only achievable on a computer, iOS and Android OS applications allow the users to view and practice with the word-cards on their mobile digital devices; chiefly, smartphones and tablets. The main software is free, with teacher accounts which can distribute word-card sets to multiple students. While paid versions of the software eliminate advertisements, the unpaid version of the platform is still highly accessible.

Within the software itself, which can be used offline after a set has been retrieved, learners have access to many various features:

- Word-lists – a simple list of words, with simple word-cards which can be shuffled, flipped, pronounced, reversed and edited.
- Word-cards – a flash-card application which can be shuffled, tagged for future revision, pronounced, auto-played or manually scrolled through.
- Learning Software – a module which tests your reception, production, and spelling, with multiple repeats and tracking of your performance.
- Speller Software – a module which pronounces the words in the word-list, testing your spelling and listening abilities. Highlights errors and repairs them.
- Test Software – tests the learner on writing, multiple choice translations and true-false questions, which are editable and trackable.
- Scatter Game – a study game which requires users to drag-and-drop the L1 words onto the L2 words, and vice-versa. Trackable and competitive, with other users completion times as the target.
- Space Race Game – a game which requires users to type the translation of a word to “drop” it before it crosses the screen. Competitive and trackable.

If nothing else, Quizlet boasts a high degree of engagement with the word-cards. All of the modules have pronunciation support, and each set can be imported, modified and exported to and from a variety of sources including spreadsheets and databases. In terms of technology, Quizlet would seem to possess a large number of potentially beneficial interactive processing capabilities (essentially, how it can present and utilise, through the various modules outlined above, the core word-list information) (Kozma, 1991: 3). While we know that the creation of word-cards also plays a vital part in learning the target words (I. S. P. Nation, 2010: 42), it is possible that the opportunities presented by Quizlet's software suite fare comparably to paper-based cards, while providing further benefits of portability, familiarity and convenience via its smartphone platform. It is primarily this hypothesis, expressed in the research questions in the previous section, into which this brief study seeks to make inroads.

Method

Context and Participants

The study was conducted at a public university located in the Kansai region of Japan with 81 undergraduate students enrolled in the Intermediate English programme. The programme is an elective course, which is generally based on a merged Four-Skills and CLT approach. Ranking tests are required to enter the course, with the majority of students studying for study-abroad placements, as well as to supplement their intra-department EFL lessons. As undergraduate students, the participants were between 18 and 20 years of age, and had all placed within the mid-range band of the Intermediate English programme. All participants possessed current-generation smartphones, with iOS phones making up the majority. The students had been introduced to Quizlet at the beginning of the semester, so operational familiarity was satisfactory. As part of the course, the students were required to learn sets of 30 TOEIC/TOEFL-sourced words per week, through methods of their choosing. These words were tested for pronunciation, spelling, meaning, and word-category recognition throughout the semester.

Research Design & Data Collection

A mixed-method research design was used to collect quantitative data – the results of the learners vocabulary tests – and qualitative data, which sought their opinions on both paper-based and digital word-card learning. In a previous lesson, students were shown a slideshow of 75 TOEIC words from the end of their course-books which they had not yet covered, and were asked to rank them for familiarity; of these, the 30 least familiar were chosen and separated into two 15-word lists.

These lists were printed onto paper and uploaded into their Quizlet class, password protected to ensure secrecy until the research session.

During the research class, students were separated into two groups, Group A and Group B. For the first list, Group A used Quizlet's digital word-card software suite, and Group B used a word-list to make paper word-cards. Each group had 15 minutes to practice, and then were tested on 5 randomly-selected words for pronunciation, spelling, meaning, and word-category recognition as they were accustomed to. Following the test, the second list was distributed, with Group A using paper and Group B on Quizlet. Following this second 15-minute practice, the participants were tested again, after which they were asked to complete a short dual-language qualitative survey, utilizing Likert-scale and open questions, accessed through Googledocs. Results were graded and collated, and will be discussed in the following section.

Results

The results of paper word-cards compared with digital word-cards

The results collected from the experiment were collated and averaged into the tables below. Table 1 shows the results class-by-class, and the overall totals:

As we can see here, there appears to be little variation between the results of each group. When considering the averages, we can see that while Group A's average Quizlet score was slightly higher than their paper score, this is mainly due to Class 2's greater-than-average difference in scores. Conversely, Group B's averaged paper score was higher, again due to Class 2, whose Group B paper score was considerably higher than their Quizlet score. On the whole, however, the scores remain relatively similar throughout the experiment, with most of the scores between Group A and Group B varying only between 0.1 and 0.4. In terms of

Table 1 Results of vocabulary tests using digital and paper word-cards

Group A Quizlet	Group A Paper		Group B Paper	Group B Quizlet
12.1	12.4	Class 1	13	12.8
13.8	12.9	Class 2	13.9	12.6
12.9	12.4	Class 3	13.2	13.1
13.7	14.1	Class 4	13.3	13.5
13.13	12.95	Combined average	13.35	13.00

Total Quizlet	Total Paper
13.05	13.13

combined average, too, the scores remain very similar differing to about the same degree. An interesting point to note is that, when combined, each Group score highest on the first test, though whether this is due to the lexical difficulty of the words, or perhaps test-fatigue as the experimental class progressed, is uncertain. Indeed, the final combined averages of all Quizlet scores tallied against all paper scores show that very little difference was evidenced; with only 0.8 variation between the combined scores, although notably in favour of paper word-cards, both methods of studying appear to be relatively well-matched.

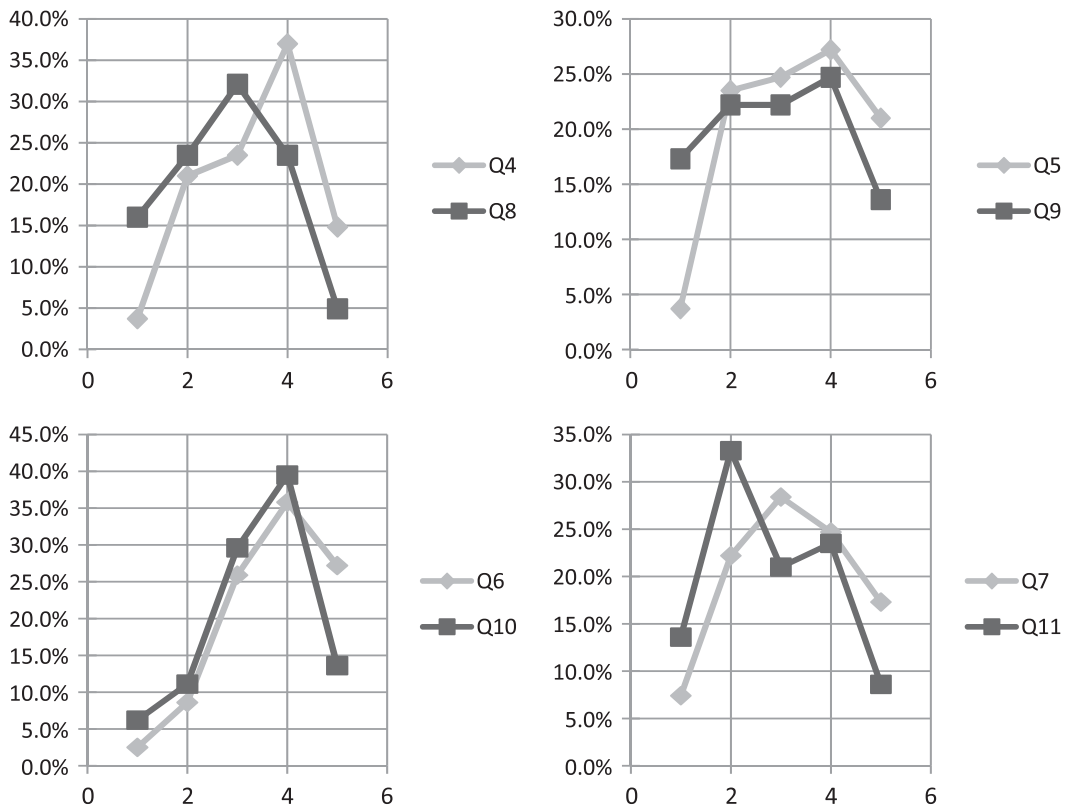
The results of qualitative opinion survey and impressions

Participants' responses to the survey concerning their impressions and opinions on each study method are shown in Table 2 below. Charts 1–4 overlap inverted results to check for comparative validity between the two groups of answers:

Table 2 displays the percentages for each answer across the 81 surveyed participants. The highest-percentage answers have been highlighted, showing that overall the digital word-cards viewed on smartphones seemed to have a slightly more positive impact on the learners surveyed; notably, roughly 35% thought the digital word-cards to be more engaging. As we can see from Chart 3, the inverted data for this question strongly mirrors each other, suggesting that the participants found the paper word-cards less engaging on the whole, despite their use producing similar if not slightly better quantitative results on the vocabulary tests. In fact, the mirrored data in the charts shows a high level of conformity; overall, participants though digital word-cards to be more accessible and engaging compared to the paper-based word cards, with only 6% of participants found making and using paper word-cards for 15 minutes engaging enough to strongly agree with the statement. Curiously, Q 11, which asked participants whether they thought paper word-cards

Table 2 Percentages showing opinions on digital and paper word-cards

	Strongly disagree		Neutral	Strongly agree	
	1	2	3	4	5
I think Digital cards are more . . .					
4) . . . effective	3.70%	20.99%	23.46%	37.04%	14.81%
5) . . . accessible	3.70%	23.46%	24.69%	27.16%	20.99%
6) . . . engaging	2.47%	8.64%	25.93%	35.80%	27.16%
7) . . . suited to my study style	7.41%	22.22%	28.40%	24.69%	17.28%
I think Paper cards are more . . .					
8) . . . effective	4.94%	23.46%	32.10%	23.46%	16.05%
9) . . . accessible	13.58%	24.69%	22.22%	22.22%	17.28%
10) . . . engaging	13.58%	39.51%	29.63%	11.11%	6.17%
11) . . . suited to my study style	8.64%	23.46%	20.99%	33.33%	13.58%



Charts 1–4 Overlap of agree-disagree answers demonstrating data validity

suiting their study style, showed 33% agreeing with the statement. Although by no means invalid, Chart 4 illustrates that this does not mirror well with the same question (Q 7) for digital word-cards; perhaps this is because participants have primarily used paper word-cards in the past.

That Quizlet’s digital word-cards generally tallied more positive results than paper word-cards is interesting, though not exactly revolutionary. Previous studies introducing new learning technologies, notably those conducted by Başoğlu (2010), Fujimoto (2012), Poulshock (2011) and Philpott (2013), report that learners generally viewed the “new” technologies positively. It is quite possible that these results merely highly the “novelty” factor of using smartphones for digital word-card practice; certainly, as warned by Salaberry (2001), and as shown by the vocabulary test data, it would be unwise to say that digital word-cards are the future of vocabulary learning.

It should be noted that the participants volunteered many comments regarding the experiment and the nature of paper and digital word-cards. A large number supported paper word-cards:

“When I was a high school student, I always studied using paper, so I like paper practice.”

「紙の方が書けるから覚えやすいと思う。やっぱり見るだけでは僕は覚えられないと感じた」－ *“I think paper cards are easier to remember. For me, I can’t seem to remember just by looking at words.”*

“I think that using paper cards for practice is more effective than using digital cards.

The main reason is this: paper cards can be written on. So, we can write important things if we find our weak-point for ourselves.”

On the other hand, there were also many favourable comments for Quizlet’s digital word-cards and practice options:

“It’s very boring for me to use paper card because it took long time to write down some words into the cards. I could learn those words much more quickly by using Quizlet. Furthermore, I could learn not only to Japanese into English but also English to Japanese very efficiently.”

「私はデジタルカードの方がよかったと思います。紙カードでは、勉強のスタイルは一つですが、デジタルカードには複数の勉強のスタイルがあるのが魅力的だと思った。」－ *“I preferred digital word-cards. With paper, there is only one way to learn, but with digital cards there are many study styles, which I thought was very engaging.”*

「紙はいつも使ってたから慣れてるから使いやすいですが、デジタルカードの方が発音もわかるし、スペルを間違えてても間違えたところがわかるから良いと思いました。デジタルのをもっと使って行きたいです」－ *“I’ve always used paper so I’m used to it, but digital word-cards have pronunciation, and if you get the spelling wrong it tells you where. I’d like to try using digital cards more in the future.”*

As predicted, the participants previous familiarity with paper word-cards featured strongly in their preferences, with many citing that the need to create and write the cards as a benefit. For the digital cards, however, many of the participants commented on the different study options, the pronunciation, as well as the level of engagement. It would appear, then, that learners like what methods they like, and while this might not always match up with the expectations of their teachers, it is this reality that teachers and researchers should strive to accommodate.

Conclusion

To conclude, the results of this brief study are straightforward. In essence, the quantitative results suggest that focused vocabulary learning using digital word-cards, such as Quizlet, on smartphones produced roughly equivalent results when compared with the more traditional paper word-cards. Qualitative findings show that digital vocabulary learning was viewed relatively positively by the body of participants, with major recognised benefits such as pronunciation functions, typing modules and the range of study options, but that on balance there is little overwhelming support for one method or the other. While limited in scope, it is hoped that this short study can provide a template for future research. For a more detailed comparison of the utility of digital word-cards vis-a-vis paper word-cards, perhaps a more longitudinal study could be conducted, say, over the course of a semester.

On the whole, then, it would appear that digital-device-based vocabulary learning has potential for expansion and greater uptake in the future; though, as stated by Fujimoto, this uptake depends primarily on the learners' perceptions of mobile devices as learning tools, which, when they are positive, should allow educators to introduce the technology into a natural, not artificial, setting.

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