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Using Computer Games to Improve Secondary School Students' Vocabulary Acquisition in English

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ABSTRACT

This exploratory study aims to investigate if computer games can expand learners' vocabulary and improve their writing performance. In testing the research instruments and procedure of a larger project, this pilot study employed only ten Form Four students who had voluntarily taken part in this study, and they were exposed to two different methods of acquiring vocabulary over a period of fourteen weeks. The two methods of vocabulary acquisition were computer games and traditional vocabulary strategies. The first method involved the subjects playing computer vocabulary games from the Internet for seven weeks. In the second method they employed traditional vocabulary strategies such as using a dictionary, contextual clues and semantic mapping for the next seven weeks. The extent of the subjects' vocabulary acquisition in the two methods was measured by using the pre and post vocabulary tests and two written essays. Results indicate a significant difference between the pre and post vocabulary tests. However, no significant difference was found between the two essays in terms of vocabulary richness. Such results might be attributable to the short duration of the treatment.

Keywords: Vocabulary acquisition, computer games, traditional strategies, lexical frequency

INTRODUCTION

"Without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (Wilkins, 1972). This effectively sums up the important role of vocabulary in a language. Vocabulary knowledge is also considered a prerequisite for successful communication (Nation, 2001). It is the realization of the centrality of the role of

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vocabulary in second language acquisition that is leading to greater emphasis being placed on vocabulary in the L2 context (Lewis, 1993, 2001).

Different strategies and methods are required to create an interest among ESL learners to successfully acquire and extend vocabulary successfully. Classroom tasks that involve extensive reading materials and instructional materials that interest students have actively involved learners in acquiring and expanding new word knowledge effectively (Horst, 2005). In Malaysia's ESL context, the learners are exposed to the first 1000 high frequency words during their primary school years (Standards 1 – 6). When learners move on to the secondary school, they are again exposed to the first 1000 high frequency words as well as the next 2000 high frequency words. Studies have shown that it is essential for learners to master the first 3000 high frequency words in order to understand at least 95% of a text (Liu & Nation, 1985; Nation, 2001).

Vocabulary is an aspect of language that has not, until recently, been given much emphasis at the early stages of second language instruction as more attention is given to structural patterns of the language than on vocabulary (Croft, 1980). When vocabulary building is given to learners together with structural items such as word forms, function words and word order at the intermediate level, it becomes an added burden to learners. It is at the intermediate level when massive vocabulary expansion begins, but the learners' vocabulary resources are found to be inadequate. The delay in vocabulary acquisition often imposes a handicap on ESL learners' language development (Hajar Abdul Rahman & Abdul Ghani, 1996).

Traditionally, learners learn vocabulary by memorizing long lists of the target words (Read, 2000), and when the learners encountered an unknown word, they quickly got help from a bilingual dictionary. Locating the required word could be quite a disruptive and tedious experience. Learners were also exposed to pictures, realia and gestures to guess the meaning of a word. The onset of the digital revolution in 1982 introduced the use of computers and telecommunication devices which made a dramatic change towards a new way of communicating and learning. The nature of L2 learning has also changed because of technology (Oxford, 2008). With the advent of computer and advances of communication technology, more learning is happening through the medium of ICT. Computer games, for example, are gaining popularity in schools and it is now possible for learners to play language games and learn new words without realizing they are extending their vocabulary. Game softwares are available with built-in dictionary at L2 learners' disposal. With a mere click on the icon selected, the meanings of words appear on the screen. Therefore, in seeking to extend learners' vocabulary acquisition, it is imperative that learners are exposed to the latest way of language learning through ICT. This is indeed a creative and imaginative as well as innovative means in language learning. Research has shown that

the learners are no longer mere receivers of information but they have the capability to create new information using networked computer systems (Dede, 1996).

The adoption of ICT in foreign language learning known also as "new humanism" (Garrett, 1989) has increased access to information and knowledge. Numerous resources are available from the Internet and for this reason it is important for schools to fully utilize computer technology (Condie *et al*., 2002; Prior & Hall, 2004). Technology has the advantage of creating a nonthreatening learning environment, as second language learners feel safe to practice the target language and self-assess work without undue embarrassment and anxiety. The non-judgmental nature of the computer gives learners the autonomy to review any part of the lesson as frequently as they wish and to receive immediate feedback and additional assistance. This reduces the learners' stress and anxiety level (Pascoe & Wibur, 2003).

In Malaysia, the Ministry of Education initiated the Smart School Project in 2003 and a total of 8000 schools were equipped with computer facilities. By 2010, it is projected that about 10000 primary and secondary schools will be fully equipped with computer facilities (MOE, 1997). This move will ensure the use of ICT in the language classroom and ensure wider usage of ICT especially in rural schools. ICT is also aimed at producing students with knowledge, creative and thinking skills, which eventually will contribute to the knowledge-based economy (Economic Planning Unit, 2001). Although the Malaysian government is spending huge amounts of money to ensure the use of ICT in schools, it is important for educators to make ICT an essential part of the learning environment. When schools are equipped with computers and Internet connections, language learning resources from the Internet can be identified and used effectively. This study is timely and important as it addresses the issue of using ICT, namely computer games that can be downloaded for free and used in the language classroom to extend vocabulary acquisition. The study seeks to verify if engagement in computer games enhances the ESL learners' writing performance.

OBJECTIVES AND RESEARCH QUESTIONS

The main objective of this study is to investigate if computer games can expand students' vocabulary. The study also investigates if computer games improve students' writing performance and determines if there is a discernable learner preference for computer games in vocabulary building as opposed to the traditional vocabulary strategies. The vocabulary density of learners' essays is be analyzed to see if they use words from different frequency levels, that is, beyond the 2000 words based on the General Service List by West (1953). In guiding the research, the following research questions are posed:

1. Does the integration of computer games expand ESL learners' vocabulary?

2. What is the range of students' vocabulary based on their essays?
3. What is the improvement in the vocabulary size between the learners' first and second essay?
4. What is the preferred strategy for acquiring vocabulary among the learners?
5. What are the reasons for students' strategy preferences in acquiring vocabulary?

REVIEW OF RELATED STUDIES ON COMPUTER GAMES

In general, using games in a language classroom is beneficial, as they are interesting, enjoyable, fun-filled, effective, engaging, interactive and motivating (Nguyen & Khuat, 2003; Uberman, 1998). Various games can be used in the language classroom to enhance learning such as board games, role-playing games and pen-and-paper games. The benefits of these games range from the cognitive aspects of language learning to the more co-operative group dynamics (Lengeling & Malarcher, 1997). These benefits have been categorized into four main categories. Firstly, language games lower learners' affective filter, encourage creative use of language, and motivate learning as games are filled with fun. Secondly, language games cognitively reinforce what is learnt. Thirdly, the games are learner-centred, and help to build class cohesion. Finally, the games are easily adapted by all age groups regardless of proficiency level and interest.

Computer games are gaining popularity and have captured the interest of training professionals for several reasons. Firstly, there is a shift in the field of learning from a traditional model of instruction to a learner-centred model which creates a learning environment that involves students in problem solving (Garris *et al*., 2002). Secondly, computer games can be an effective tool for enhancing learning and understanding complex subject matter (Cordova & Lepper, 1996; Ricci *et al*., 1996). Thirdly, learners are greatly and intensely involved during game play, especially today's generation.com learners (Prensky, 2001). Besides that, learners prefer learning that is supported by educational games than non-game activities. Learners have been seen to perform better in learning new words if they are exposed to electronic games compared to those who learned the same vocabulary through traditional strategies (Yip & Kwan, 2006).

Computer-based learning and online learning are much appreciated and enjoyed by learners in school and at tertiary levels (Condie & Livington, 2007). The computer with its multimedia and hypermedia features is a powerful learning tool. Computers allow learners to use multisensory elements, text, sound, pictures, video and animation, which provide a meaningful context to facilitate comprehension (Pascoe & Wibur, 2003). Furthermore, computer games allow learners to connect words and sentences to pictures or animations in context of a particular setting. Computer games also permit learners to understand more complex

vocabulary and concepts with the help of animation and sound features. Moreover, learners usually play the same games many times and acquire more vocabulary untiringly through this repeated activity. This is because their focus is on the message and not the form (Krashen, 1982). Indeed, computer games can provide an alternative to daily routine classroom activities that may not entertain learners. Besides these, by using computer games, learners feel excited, motivated and engaged in learning (Hadfield, 1987).

The problems faced by many learners are that despite having learnt all the basic structures in English, they still have limited receptive and productive vocabulary. This is generally true with ESL learners as they are inclined to use their mother tongue rather than the L2 even in the English classroom. The small range of productive vocabulary limits learners in expressing themselves clearly and appropriately especially in their essay writing. Sometimes they confine themselves to a limited range of familiar vocabulary or produce expressions that sound odd or unidiomatic. As such, they are likely to hesitate to speak, or to speak more slowly and write less than the native speakers (Read, 2000). They not only have problems in understanding the meaning of words but are reluctant to use them appropriately in their writing (Laufer & Nation, 1999). Some learners choose more frequent words in their writing due to their reluctance, and this reluctance is often a result of uncertainty about the word's usage (Laufer & Nation, 1999). The lack of confidence is a reflection of imperfect knowledge. So, if English can be learnt in an enjoyable way, then vocabulary will become readily available and learners will be able to express themselves fluently and confidently. Thus in this study, free computer games are downloaded and used to expand learners' lexicon.

METHODOLOGY

This exploratory study was conducted in a semi-urban school. The subjects were ten Form Four students who volunteered to participate in the study. They were of mixed gender, ethnicity and language proficiency. This study employed a within-subject design that allowed the same participants to be exposed to two treatment conditions to acquire vocabulary. The study was conducted for fourteen weeks. All the subjects were exposed to the traditional strategies of acquiring vocabulary that were using a dictionary, contextual clues and semantic mapping before receiving the second treatment via computer games. The subjects sat for four parallel vocabulary tests and wrote two parallel narrative essays on different topics. The vocabulary tests consisted of words from the 2000-word level and were adapted from Nation (1983). The words in both the treatments consisted words from the first 1000-word level, 2000-word level and words from the Academic Word List (AWL).

At first, the subjects took a vocabulary pre-test to identify and evaluate their vocabulary knowledge. Then, they were exposed to traditional vocabulary strategies

using a dictionary, semantic mapping and contextual clues. These three strategies were the most preferred vocabulary learning strategies chosen by learners in a research study involving Form Four students (Kanthimathi, 2005). This method of acquiring vocabulary was carried out for seven weeks. After the seventh week, a vocabulary post-test was conducted and their scores were recorded.

Besides the vocabulary test, the subjects also wrote a narrative essay. The purpose of the essay was to examine if the subjects have expanded their lexical knowledge after the first treatment. At the beginning of the eighth week, the participants were given a parallel vocabulary pre-test before they were engaged in the computer games. The subjects spent an hour weekly in the computer laboratory to play the computer games for seven weeks. Each subject was given a CD with the computer games to be played at home during their leisure time. Some of the games in the CD were Mystery Case Files, Speed Word, Letter Rip, Fowl Words, Word and Crossword Puzzle. After the fourteenth week, the participants were given a parallel vocabulary post-test and they were required to write another narrative essay with a different topic.

In addition, a questionnaire was administered at the end of the study to collect the subjects' demographic data, vocabulary learning strategies, experience with computers and opinions on the computer games. The participants were also asked to keep a journal to write their opinions of the vocabulary strategies they were exposed to throughout the fourteen weeks. The participants were also interviewed by the researchers to find out their preferences regarding the strategies in acquiring vocabulary.

RESULTS AND DISCUSSION

Students Vocabulary Expansion and Density

The discussion on the results is guided by the objectives of the study. A pre and post vocabulary test was administered to determine the subjects' expansion and density of vocabulary gained after the treatments, which are traditional strategies and computer games. Data were also collected through the essays and analyzed using VocabProfile, a computer programme which gave the percentage of words at each of the four frequency levels: the first 1000 words, second 1000 words, the AWL, and words not in the list. The mean score of the pre and post vocabulary test data shows that seven subjects have an average score of above the 12.7 mean in all the four tests (see Table 1). In the vocabulary pre-test given before the traditional strategies, four subjects achieve 85% and above score in the 2000-word level indicating that only 150 words are not available for productive use. While at the post-test, seven subjects achieve the 2000-word level. As for the pre-test of computer games, six subjects are in the category of 2000-word level, and finally for the computer games post-test, nine subjects are at the 2000-word level.

Table 1 shows *t*-test results on all the four tests. The mean pre-test score for the

traditional strategies (TS) is 12.7, and the post-test 13.7. The mean pre-test score for the computer games (CG) is 13.5 and 14.9 for the post-test. The *t*-test shows that in both strategies, the changes are statistically significant.

On the other hand, data obtained from the VocabProfile software shows that all the subjects used more high frequency words from the first 1000-word level in both essays (Table 2).

The total number of words of all the ten subjects' pre-test essays is 3006, with 2537 words from the first 1000-word frequency level. Only 221 words are from the 2000-word frequency level and 54 words from the AWL. Only 194 words are from the not-in-list low frequency words in the essays written by the ten subjects. Similarly, in the post-test essays of the ten subjects, more high frequency words from the first 1000-word frequency level are used (2390 words from a total of 2963 words). This may be because L2 writers have shown to use a high percentage of lexical repetition (Connor, 1984; Ferris, 1994). Besides, text written

		Mean	Sd	*t*-test	df	*p*
Pair 1	Vocabulary Test (TS)					
	Pre	12.7	1.56	-4.81	9	.001
	Post	13.9	1.28			
Pair 2	Vocabulary Test (CG)					
	Pre	13.5	.97	-8.57	9	.001
	Post	14.9	.99			

Fig 1: Gains in Vocabulary Test Scores for Traditional Strategies and Computer Games

TABLE 1
Vocabulary Test Scores for Traditional Strategies and Computer Games

Respondents	Scores	Traditional Strategies		Computer Games	
		Pre-test	Post-test	Pre-test	Post-test
1		14	15	15	16
2		14	14	14	15
3		14	15	14	16
4		13	14	13	15
5		13	14	14	16
6		13	15	14	15
7		14	15	14	15
8		10	11	13	14
9		12	13	12	13
10		10	13	12	14
Mean		12.7	13.7	13.5	14.9

TABLE 2
Word Frequency in Pre and Post Essays

Word List	Post-Test (TS)		Post-test (CG)	
	Word (n=10)	Percentage(n=10)	Word (n=10)	Percentage (n=10)
1000	2537	84.40	2390	80.66
2000	221	7.35	227	7.66
AWL	54	1.80	135	4.56
Not-in-List	194	6.45	211	7.12
Total	3006		2963	

TABLE 3
Percentage of Words in Four Frequency Levels in Post-Test Essays (TS)

Word List Respondents	1000	2000	AWL	Not-in-List
1	80.59%	10.20%	2.30%	6.91%
2	87.63%	5.69%	2.34%	4.35%
3	82.14%	7.47%	0.65%	9.74%
4	86.10%	8.81%	0.34%	4.75%
5	85.90%	4.59%	1.64%	7.87%
6	87.29%	6.69%	2.01%	4.01%
7	80.86%	10.23%	2.31%	6.60%
8	85.71%	6.64%	0.66%	6.98%
9	83.06%	6.64%	4.98%	5.32%
10	84.88%	6.53%	0.69%	7.90%

by L2 writers generally have less lexical variety, specificity and sophistication than those written by L1 writers (Crossley & McNamara, 2009). The results show that the subjects' vocabulary density is still on the use of words from the 1000-word level although their vocabulary test results show that they have the knowledge of 2000-word level. This shows that subjects frequently choose words from the first 1000-word level in their writing. This could be due to their unwillingness and uncertainty about the word usage (Laufer & Nation, 1999).

Besides, each subject's usage of words in the four frequency levels of the post-essays is also analyzed (see Tables 3 and 4). The score shows that more than 80% of the vocabulary used by the subjects in their essays is from the first 1000-word level. Most essays have limited words from the 2000 and the AWL-word levels. Only two subjects, i.e. R1 and R7, used 10.20% and 10.23% of words respectively from the 2000-word level in their essays. The other eight subjects used only 4.59% to 8.81% of words from the 2000-word level in their

essays. Only one subject used a minimal number of words (4.98%) from the AWL word list. The usage of words from the not-in-list level is between 4.01% and 9.74%. Thus, the score from the post-test essays written after the use of traditional strategies shows the subjects' usage of high density of words from the first 1000-word level.

Similarly, in the post-test essays written after the treatment of computer games, students' usage of words from the 1000-word level is still high. However, four students have used fewer words from the 1000-word level and have gradually increased their usage of words from the 2000-word level (Table 4).

For example, R1 used 77.63% of words from the 1000-word level, and R7 used 78.60% respectively. At the 2000-word level, both the subjects have shown a gradual increase of 9.54% and 9.59%. This shows that they have acquired and have attempted to use words from the 2000-word level in their essay writing.

As for R3 and R5, both have a percentage of 75.25% and 64.57% in the first 1000-word level. In the 2000-word level, both subjects have only used about 5% of words from this category. However, R3 and R5 have obtained scores of 9.24% and 13.25% in the AWL, and 10.56% and 17.55% from the not-in-list. It can be concluded that R3 and R5 have attempted to use words form the low frequency level even though their scores are still minimal, and R3 and R5 have also obtained scores between 80% and 90% in their vocabulary tests. This shows that these two subjects have the mastery of 2000-word knowledge (Laufer & Nation, 1999), but are still reluctant to use such words confidently in their essays.

When the comparison of results between post-test essays given immediately after each treatment (traditional versus computer games) is analyzed, three subjects have shown a decreased use of high frequency words. For example, R5 used 85.90% of words from the first 1000-word level in the

TABLE 4
Percentage of Words in Four Frequency Levels in Post-test Essays (CG)

Word List Respondents	1000	2000	AWL	Not-in-List
1	77.63%	9.54%	3.29%	9.54%
2	81.63%	6.46%	5.78%	6.12%
3	75.25%	4.95%	9.24%	10.56%
4	87.20%	7.61%	2.42%	2.77%
5	64.57%	4.64%	13.25%	17.55%
6	83.84%	7.07%	4.38%	4.71%
7	78.60%	9.59%	2.21%	9.59%
8	85.05%	9.97%	1.99%	2.99%
9	84.77%	8.94%	0.99%	5.30%
10	88.33%	8.00%	1.67%	2.00%

TS essay, and the percentage has dropped from 21% to 64.57% of words from the first 1000-word level in the CG post-test essays. This shows that after the CG treatment, R5 has acquired and used new vocabulary above the 1000-word level. Further, R5's dependency on the first 1000-word level has decreased. Similarly, R2 and R3 used 87.63% and 82.14% of words respectively from the 1000-word level for their TS essays, but the usage of the first 1000-word level dropped to 81.63% and 75.25% in their CG essays. There was a decrease of 6% of words from the first 1000-word level in the CG essays of these two subjects. Although the difference is minimal, the data shows that the CG treatment did have an effect on the subjects' vocabulary acquisition.

As for the 2000-word level, R8 and R9 used 6.64% of words from the 2000-word level in their TS essays. In the CG essays, both the subjects have shown an increase of 3.33% and 2.30% respectively to 9.97% and 8.94% in the 2000-word level. This again shows that the CG treatment has had a minimal effect on the subjects' use of vocabulary from the 2000-word level as compared to the other subjects in this study.

In the AWL, R3 and R5 have shown an improvement of 8.59% and 11.61% respectively from their TS to CG essays. It shows that both the subjects are able to use words beyond the 2000-word level. Although there is a slight increase of word choice in their essays from the AWL category, it shows that the CG has contributed towards better vocabulary attainment.

Preferred Strategy for Vocabulary Acquisition and Reasons

Data concerning the subjects' most preferred strategy of acquiring vocabulary was obtained from the questionnaire, interviews and their journal reflections. Data from the questionnaire (Table 5) showed that 90% of the students preferred learning vocabulary through computer games. The reasons stated are that the games are fun, interesting, and the illustrations are helpful. They also remembered the words better

TABLE 5
Students' Attitudes towards Computer Games

No	Statements	Agree (n)	Disagree (n)
1	I like learning vocabulary through the computer games	9	1
2	I had fun learning vocabulary using the computer games	9	1
3	Learning words through games is more interesting	10	
4	The use of computer games has expanded my vocabulary	9	1
5	The illustration on the games were helpful in acquiring vocabulary	10	
6	The activities in the games were interesting	9	1
7	I am able to remember the words better by playing the games	9	1
8	I am confident with my vocabulary after playing the games	9	1
9	Computer games is the best technique to acquire vocabulary	8	2

and they were more confident using the acquired vocabulary. Traditionally, games are used in the language classroom for a variety of purposes, for example, as an introduction to a lesson or as time-fillers. Nevertheless, games enhance incidental acquisition of vocabulary that makes the lesson more interesting, enjoyable and fun because the games are challenging, and games encourage lower proficiency learners to participate (Uberman, 1998).

Furthermore, the subjects preferred to acquire vocabulary through computer games because 8 of them did their homework, revision, and accessed information using the computer. They also played the computer games and communicated with their friends through e-mails, and they were comfortable working with computers (see Table 6). Their familiarity with the computer also contributed towards their preference in using computer games to learn new words.

Besides using computer games to acquire vocabulary, 8 subjects also used the dictionary to look up meanings of new words, and guessed the meanings of new words through contexts in which the word was used. All the subjects sometimes listed down the words in their notebook or read and reread the new words several times to help them remember the new lexis. However, all the subjects never resorted to semantic mapping as a way of learning new vocabulary (see Table 7).

Data from the interview transcription reveals that all the subjects preferred the computer games in acquiring vocabulary because it was interesting. The reasons for

TABLE 6
Students' Familiarity with Computer Games

No	Activity	Liked (n)	Disliked (n)
1	I use computer to do homework.	7	3
2	I use computer to do my revision.	7	3
3	I use computer to access information.	9	1
4	I use computer to communicate with friends.	9	1
5	I use computer to play games.	9	1

TABLE 7
Students' Preference for Traditional Strategies

No	Statements	n
1	I always look up the meaning of the new words in my English dictionary.	8
2	I always try to guess the meaning of the new words through the context in which it is used.	7
3	I sometimes list down the words in my notebook because writing helps me remember the words.	10
4	I sometimes read and reread the new words several times	10
5	I never do a mind-map of the new word to relate it with other words	10

their preference for computer games are the same as mentioned in their questionnaire. Learners playing online vocabulary games tend to learn better and they can also retain the learned vocabulary for a longer period (Yip & Kwan, 2006). The students also said that they learned while playing the games, and playing games was also challenging (see Table 8).

TABLE 8
Reasons for Computer Game Preference

No	Opinions	n
1	Interesting	10
2	Fun	6
3	Colourful graphic	5
4	Exciting	5
5	Easy to remember new words	5
6	Can play and learn	4
7	Challenging	4

Finally, the subjects' journal reflections also show their learning strategy preference. The themes gathered from their journals show that all the subjects preferred computer games because they were interesting and fun, and they learnt new words through games. However, some subjects gave a few negative remarks about the CG, for example, they were angry because they were unable to find the clues to solve the puzzles due to the difficulty level and the limited play time (see Table 9).

TABLE 9
Students' Journal Reflections in using Computer Games

No	Opinions	n
A	Positive Opinions	
1	Games are fun	10
2	Games are interesting	10
3	Can learn new vocabulary	10
4	Like to play the games	5
5	Games are enjoyable	6
6	Learn through playing	4
7	Games are challenging	6
8	Games has animation	6
B	Negative opinions	
1	Angry because cannot find the clues	1
2	Activities are difficult to solve	3
3	Limited time to play games	2
4	Difficult to look for hidden words	1
5	Pictures are small and tires the eyes	2

The above data indicate that subjects preferred to learn vocabulary through computer games because computer games are interesting, fun, enjoyable, challenging and colourful. Acquiring vocabulary through games is engaging, and it can become effective and having a place in learning (Van Eck, 2006).

CONCLUSION

Learners' vocabulary size plays an important role in their daily spoken and written communicative and academic tasks. This study shows that the students have the vocabulary knowledge of the 2000-word level but was unable to use the words in their writing. This supports the finding that students are not confident and are unable to use the vocabulary knowledge they have in the real context (Laufer & Nation, 1999).

Although they acquired new words through exposure to both strategies, the gained word knowledge was not used to the maximum in their essays. The number of words used was relatively high in the first 1000-word level in both the essays.

Students claimed that they preferred and enjoyed learning new words through computer games, but it did not have much implication in their essay, as they were still comfortable using the high frequency words from the first 1000-word level. The study reveals that there is not much difference in students' essays after the vocabulary input. The result could be attributable to the small number of subjects (n=10), and the short duration of treatments that was only seven weeks each. Future studies should increase the duration for treatments. L2 vocabulary learning is different from that of L1 that is learnt incidentally from contexts, and it is unrealistic to expect a similar lexical development among L2 learners (Laufer, 1994).

REFERENCES

Hajar Abdul Rahman, & Abdul Ghani. (1996). Teaching vocabulary using computer language games. In Mukundan, J. & Teh, C. S. (Eds.), *Trends in English language teaching* (p. 1-13). Serdang: UPM Press.

Connor, U. (1984). A study of cohesion and coherence in ESL students' writing. Papers in Linguistics: *International Journal of Human Communication, 17*, 301-316.

Condie, R., & Livingston, K. (2007). Blending online learning with traditional approaches: Changing Practices. *Journal of Educational Technology*, *38*(2), 337-348.

Condie, R., Simpson. M., Payne, F., & Gray, D. (2002). *The impact of ICT Initiatives in Scottish Schools*. Retrieved from http://www.scotland.gov.uk/library5/education/ ins2.00.asp.

Corodova, D. I., & Lepper, M. R. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization and choice. *Journal of Educational Psychology*, *88*, 715-730.

Croft, K. (1980). *Readings on English as a second language.* Toronto: Little Brown and Company.

Crossley, S. A., & McNamara, D. S. (2009). Computational assessment of lexical differences in L1 and L2 writing. *Journal of Second Language Writing*, *18*, 119-135.

Dede, C. (1996). Emerging technologies and distributed learning. *American Journal of Distance Education, 10*(2), 4-36.

Economic Planning Unit (2001). *Eighth Malaysian Plan 2001-2005*. Kuala Lumpur: Malaysia National Publication.

Ferris, D. R. (1994). Lexical and syntactic features of ESL writing by students at different levels of L2 proficiency. *TESOL Quarterly*, *28*, 414-420.

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation and learning: An interdisciplinary. *Journal of Theory, Practice and Research*, *33*, 940.

Garrett, N. (1989). Computers in foreign language teaching and research: A new humanism. In W.H. Graves (Ed.), *Computing across the curriculum: Academic perspective* (pp.101-139). McKinney, TX: Academic Computing Publications, Inc.

Hadfield, J. (1987). *Advanced communications games: A collection of games and activities for intermediate and advanced students of English*. London: Thomas Nelson and Sons Ltd.

Horst, M. (2005). Learning L2 vocabulary through extensive reading: A measurement study. *The Canadian Modern Language Review, 61*, 3.

Kanthimathi, L. (2005). *Vocabulary teaching and learning strategies in English for Science and Technology.* Unpublished MA Thesis.

Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Oxford: Pergoman Press.

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In Lauren, C., & Nordmanm, M. (Eds.), *Special language: From human thinking to thinking machines*. Clevedon: Multilingual Matters.

Laufer, B. (1994). The lexical profile of second language writing: Does it change over time? *RELC Journal*, *25*(2), 21-33.

Laufer, B., & Nation, P. (1999). A vocabulary-size test of controlled productive ability. *Language Testing*, *16*(1), 33-51.

Lengeling, M., & Malarcher, C. (1997). Index cards: A natural resources for teachers. *Forum*, *35*(4), 42.

Lewis, M. (1993). *The lexical approach*. Hove, England: Language Teaching Publications.

Lewis, M. (2001). *Implementing the lexical approach: Putting theory into practice.* Hove, England: Language Teaching Publications.

Liu, N., & Nation, I. S. P. (1985). Factors affecting guessing vocabulary in context. *RELC Journal*, *16*(1), 33-42.

Ministry of Education Malaysia. (1997). *Smart school flagship application: The Malaysian smart school a conceptual blueprint.* Kuala Lumpur: Ministry of Education.

Nation, I. S. P. (2001). *Learning vocabulary in another language*. United Kingdom: Cambridge University Press.

Nguyen, T. T. H., & Khuat, T. T. G. (2003, December). Learning vocabulary through games. *Asian EFL Journal*, *5*(4). Retrieved from http://www.asian-efl-journal.com/ dec_03_sub.Vn.php.

Oxford, R. L. (2008). *How the digital age is transforming the way we learn foreign and second languages.* Singapore: Seameo Regional Language Centre.

Pascoe, B., & Wibur, M. (2003). *Technology and teaching English language learners*. USA: Pearson Education.

Prensky, M. (2001). *Digitial game-based learning*. USA: McGram Hill.

Prior, G., & Hall, L. (2004). *ICT in schools survey. ICT in school research and evaluation* (Series 22). Annesley, Nottingham: DfES/Becta.

Read, J. (2000). *Assessing vocabulary*. Cambridge: Cambridge University Press.

Ricci, K., Salas, E., & Cannon-Bowers, J. A. (1996). Do computer-based games facilitate knowledge acquisition and retention? *Military Psychology*, *8*(4), 295-307.

Uberman, A. (1998). The use of games for vocabulary presentation and revision. *Forum*, *36*(1), 20.

Yip, F. W. W., & Kwan, A. C. M. (2006). Online vocabulary games as a tool for teaching and learning English vocabulary. *Educational Media International*, *43*(3), 233-249.

Van Eck, R. (2006, March/April). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE Review*, *41*(2), 16-30.

West, M. P. (1953). *A general service list of English words*. London, New York: Longmans.

Wilkins, D. A. (1972). *Linguistics in language teaching*. US: MIT Press.