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The Impact of Supplemental Reading on Vocabulary Acquisition and Retention with EFL Learners in Taiwan

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Abstract

Research has shown that incidental vocabulary learning takes place when learners read extensively. However, not many EFL students can engage in large amounts of reading in Taiwan. In an attempt to incorporate larger amounts of reading into EFL classroom instruction and to compare the effect of this practice with that of vocabulary exercises, the researchers conducted a classroom-based study over a 5-week period. The participants were 50 male students, at an intermediate level of English proficiency, in their third year of study in a senior high school. Half of them received the reading-plus-vocabulary- enhancement (RV) instructional treatment: they read selected texts and also practiced various vocabulary exercises. The other half received the narrow reading (NR) treatment: they read thematically-related supplemental materials on the same topics presented in the selected texts. A Chinese version of the Vocabulary Knowledge Scale (VKS) was then employed to assess students' knowledge of 50 vocabulary items. The RV group significantly outperformed the NR group on both acquisition and retention tests, and demonstrated significantly more productive knowledge on the acquisition test and more receptive knowledge on both tests.

Keywords: vocabulary exercises, vocabulary acquisition and retention, EFL learners, Taiwan

Introduction

Vocabulary knowledge has long been deemed a major determinant influencing ESL/EFL reading comprehension (Laufer, 1997). Yet not until recently did the issue of vocabulary acquisition receive a lot of attention from researchers or teachers. Zimmerman (1994) pointed out that researchers and teachers tended to prioritize syntax and phonology as being central to language pedagogy. Huang (2001), investigating English classes in Taiwan, found that teachers spent a lot of time analyzing sentence patterns and on translation instruction without paying enough attention to vocabulary teaching and to the relation between vocabulary and reading comprehension. Students were taught new vocabulary by rote memorization, leaving them feeling bored.

In fact, several researchers in the field of vocabulary acquisition (Laufer, 1991, 1997; Nation, 1993; Ridgway, 1997; Smith, 1998) found that vocabulary knowledge was closely related to reading comprehension. In reading an English text, vocabulary difficulty has consistently been found to be the most significant predictor of overall readability (Nation & Coady, 1988). If vocabulary knowledge is one of the keys to reading comprehension, how many words does an EFL learner need to know then? Laufer (1991) estimated that "the turning point of vocabulary size for reading comprehension is about 3,000 word families." By word families, she meant a base form plus its inflected and derived forms, which increases the total amount to about 5,000 lexical items. In other words, without the basic 3,000 word families, or 5,000 lexical items, ESL/EFL learners are less likely to predict with relative success the meanings of an authentic text. Only when learners have a command of 3,000 word families can they understand about 90% to 95% of the running words of any text.

Given the close relationship between ESL/EFL learners' vocabulary command and their ability to understand English readings, researchers have been searching for ways to effectively enhance students' acquisition and retention of learned vocabulary knowledge. Many techniques of direct vocabulary instruction have been reported effective through such attempts, including glosses (Hulstijn, 1992; Hulstijn, Hollander & Greidanus, 1996; Watanabe, 1997), mnemonic devices (Beaton, Gruneberg & Ellis, 1995), morphological and syntactic analysis (Anglin, 1993; Bauer & Nation, 1993; Nation, 1994), just to name a few. Despite its proven effectiveness, direct vocabulary instruction suffers the criticism of decontextualization and appears to be inadequate to prepare learners in ESL/EFL classrooms for the basic vocabulary size (3000-5000 word families, Nation & Waring, 1997) demanded by most English textbooks used at most EFL secondary high schools.

A more plausible approach, suggested by L1 studies on vocabulary growth (Coady, 1997), is to train ESL/EFL students to become independent word learners through extensive reading (Brown 2000; Day & Bamford, 1998; Krashen, 1989 U; Nation, 1990). The rationale of this strand of research is drawn on input-oriented language acquisition theory, arguing that learners will make meaning-form connections while processing meaningful and contextualized input. Although researchers concurred that reading is one important key to vocabulary acquisition, the effectiveness and efficiency of this approach has been under attack, especially when compared with reading plus supplementary word-focused activities (Knight, 1994; Laufer & Hill, 2000; Paribakht & Wesche, 1997) and when applied in instructed foreign language context (Laufer, 2003). As succinctly pointed out by Rott (1999), a pedagogically-sound vocabulary instruction should involve ESL/EFL learners in two circumstances: "reading for meaning under an enhanced condition, to ensure a basic lexicon, as well as under a normal condition, to advance beyond the basic requirement" (p. 593). The enhanced condition refers to reading plus word-focused activities, and the normal condition to extensive reading. Drawing on this argument, it appears that EFL secondary school students who are in the process of learning the basic lexicon (3000-5000 family words) should learn the required vocabulary in an enhanced condition. In the current study, the researchers wished to add to the extant database on the relative effectiveness of reading with focused vocabulary activities and reading only activities by providing more empirical evidence from EFL secondary school students' vocabulary knowledge acquisition and retention in instructed foreign language contexts.

Literature Review

L2 Vocabulary Acquisition through Reading

Krashen (1989) maintained that reading is the principal source of lexical increase in L2. Yet this argument was deemed as an intuition-appealing contention, which has been drawn on studies reporting general vocabulary progress during class reading (Elley, 1991) or after-class reading (Elley & Mangubhai, 1983; Parry, 1993, 1997; Shu, Anderson & Zhang, 1995; Wode, 1999) rather than on empirical evidence showing significant gains on particular words. Even in cases where empirical studies were conducted (Day, Omura & Hiramatsu, 1991; Dupuy & Krashen, 1993; Mason & Krashen, 1997; Pitts, White & Krashen, 1989), methodological flaws abounded in their experiment designs, ranging from a lack of pretest-posttest design to control for subjects' knowledge of the tested vocabulary items (Day et al., 1991; Dupuy & Krashen, 1993; Mason & Krashen, 1997; Pitts, White & Krashen, 1989), to absence of a control group (Pitts, White & Krashen, 1989), a lack of sensitivity of measuring instruments (Dupuy & Krashen, 1993; Mason & Krashen, 1997), and a failure to examine the long-term effect of reading.

In addition to questioning the effectiveness of reading on incidental vocabulary growth, the efficiency of such an approach in instructed contexts has also raised concern. Studies reporting incidental vocabulary acquisition while reading text for meaning all found a small gain of vocabulary (Cho & Krashen, 1994; Horst & Meara, 1999), though some of the word gains reached a significant level (Day et al., 1991; Dupuy & Krashen, 1993; Pitts et al., 1989). These low rates of vocabulary growth have led Laufer (2003) to question the efficiency of reading on vocabulary acquisition in foreign language classrooms. Although Laufer compared findings from studies using varied approaches, reading materials and subjects, her point was to urge researchers to critically examine the "default" and popular beliefs in the power of reading in increasing lexical growth and retention.

Rott's quasi-experimental study, albeit not a direct response to Laufer's call, critically examined the effects of reading on vocabulary acquisition and retention among university students learning German as a foreign language, with a focus on the effects of exposure frequency and text variables. She chose 12 lexical items (6 nouns and 6 verbs) and wrote six different paragraphs for each one. Ninety-five subjects were divided into three groups, each reading 2, 4, or 6 paragraphs (exposure frequency) containing the 12 target words respectively. To control for the text variables, each paragraph presented the target word in a different context, with the target word showing up in important propositions. Two vocabulary tests--recognition and production--were employed to measure different levels of word learning. The findings are summarized as follow.

In terms of the impact of reading on incidental lexical growth, students who encountered an unfamiliar word two, four, or six times during reading showed significantly more word knowledge than those who did not on immediate acquisition tests and retention test 1 week after the treatments ended. Regarding the long-term vocabulary retention, almost all learners retained a significant amount of receptive vocabulary knowledge over one month but approximately half of them showed a significant decline in productive word knowledge. Finally, concerning the impact of exposure frequency on lexical growth, there were no significant differences in learners' receptive and productive word knowledge when they were exposed to unfamiliar words two and four times during reading. When learners encountered an unknown word six times, however, they demonstrated significantly more receptive and productive word knowledge than their counterparts who were exposed to the target words 2 and 4 times respectively.

On first sight, Rott's findings did provide empirical evidence to support the impact of reading on vocabulary acquisition and retention and addressed Laufer's (2003) concern over the effectiveness and efficiency issues mentioned previously. Yet the tight control over text variables (an entire paragraph with sufficient clues for subjects to infer only one easy target word relevant to the main idea) rendered the reading materials and contexts inauthentic. In actuality, her findings were more of an effect of the researcher's intervention than that of natural extensive reading. As such, her findings can be interpreted only as a result of "enhanced condition" in which highly contrived readings were exploited to facilitate word inferencing, learning, and retention rather than that of "normal condition."

Vocabulary Acquisition through Reading plus Other Activities

Studies comparing the effectiveness of reading only and reading supplemented with another activity all reported the latter's superior effectiveness on vocabulary growth (Knight, 1994; Laufer, 2003; Laufer & Hill, 2000; Luppescu & Day, 1993; Paribakht & Wesche, 1997). Learners consulting electronic (Knight, 1994; Laufer & Hill, 2000) or paperback (Luppescu & Day, 1993) dictionaries for unfamiliar words while reading retained more words on the immediate and delayed tests (Knight, 1994; Laufer & Hill, 2000) at both receptive and productive levels (Knight, 1994) than those who did not.

In an attempt to compare vocabulary learning through reading with vocabulary learning through productive activities, Laufer (2003) conducted three experiments. In each experiment, there was a control group that read the new words in text context either with L1 glosses in the margin or without glossing but with the availability of bilingual dictionaries. The experimental group either wrote sentences with the target words of which the L1 translation equivalents were provided for students' reference, or composed a letter by using target words whose English translation equivalents were supplied for students' reference. Results show that the "reading group" recalled significantly fewer words than the "sentence writing" and "sentence completion" groups on both immediate and delayed tests. "Sentence completion" group significantly outperformed "sentence writing" group on the delayed test. Taken together, the effectiveness of vocabulary focused tasks on both short- and long-term lexical retention was more superior to that of reading only, and different task demands of vocabulary enhancing activities appear to exert differential impacts on vocabulary retention. Learners involved in productive word-focused tasks are more likely to recall words than those engaged in receptive tasks. However, most of the previous studies are based on a single encounter of unknown words in texts, rendering the results less applicable to authentic instructional contexts.

In response to the previous ecology issue, Paribakht and Wesche (1997) examined the effects of two reading approaches-- the reading only and reading plus text-based vocabulary exercises—on ESL college students' vocabulary growth in an authentic comprehension-based program 2 hours per week for a span of a semester. Employing a vocabulary measure named Vocabulary Knowledge Scale (henceforth VKS), they found that both approaches led to word gains (Paribakht & Wesche, 1993; Paribakht & Wesche, 1996). Yet reading combined with text-based vocabulary exercises led to gains in L2 vocabulary knowledge that were superior to those obtained from reading for comprehension only. Paribakht and Wesche's (1997) findings are encouraging to most EFL English teachers at the secondary level because they provided an avenue to resolving a gnawing problem—how to effectively and efficiently increase ESL/EFL students' vocabulary size to 3000-5000 word families in instructional contexts. Most EFL teachers deem it difficult, if not impossible, for EFL teenage learners to engage in extensive reading on their own after school and to increase their English vocabulary size at a rate like their native counterparts do, given the drastic difference in learning environments and motivations. A more realistic way to assist EFL students in acquiring the basic 3000-5000 vocabulary is to "combine reading with enhancement activities" (Paribakht & Wesche, 1997; Rott, 1999) in classroom contexts.

Critique

Despite the fact that Paribakht and Wesche's (1997) findings provide EFL teachers with an empirically tested method to increase students' vocabulary acquisition, they left the issue of long-term vocabulary retention unaddressed. Although they reported that their subjects retained some of the words learned during the earlier months of the instructional period, this conclusion was by no means definitive given that they did not provide any empirical evidence. The issue of vocabulary retention is of pivotal importance to EFL teachers in instructional contexts because they do not want to witness the effects of vocabulary-enhancement activities on students' lexical development to dwindle to nothing in just a month or two. In addition, Paribakht and Wesche (1997) did not further analyze the students' score gains. Although they pointed out that a large number of learners in the reading plus treatment appeared to "have achieved greater depth in their knowledge of these words" (p. 189), specific gains on receptive and productive word knowledge were unclear. The last problem with Paribakht and Wesche's (1997) study concerns their research design. Thy administered two different instructional treatments to the same group of students and as a result, had to use different sets of reading materials and target words for each treatment. One does not know if the reported differences in word gains between the two instructional treatments were an effect of the treatments or an effect of the different readings and target words.

Contrary to the foregoing research conducted in western countries, the focus of local vocabulary research centered only on the size issue (Huang, 2001; Lin, 1995). For example, Huang (2001) found that Taiwanese senior high school students acquired merely about 2000 frequent words after learning English at school for 5 years (four classes per week), which is far fewer than what the course has offered in high schools. Lin (1995) compared senior high school students' English proficiency with that of vocational high school students and reported that the latter's vocabulary size was much smaller and reading comprehension ability much lower than the former. Lin concluded that the vocational high school students could not effectively get information from reading passages. Although Huang's (2001) and Lin's (1995) research provided us with information on the inadequacies of senior high and vocational school students' vocabulary, they did not touch upon the learners' process of vocabulary acquisition and levels of vocabulary knowledge.

Research Questions

Given the previous discussion on Paribakht and Wesche's (1997) experimental design and the lack of understanding of the depth of vocabulary knowledge among local senior high school students, the researchers wished to find out the impact of reading combined with vocabulary-focused activities on EFL secondary school learners' vocabulary acquisition and long-term retention in an instructional context. Another group engaging in narrow reading (reading supplemental texts on the same theme) served as a control group. The researchers' purpose was to examine whether the combination of a reading class plus vocabulary-enhancing exercises could better increase foreign language teenage learners' vocabulary retention than a class devoted to multiple readings of the same theme. Specifically, the researchers sought to answer the following research questions. The first two questions look at the respective and comparative effects of each instructional treatment immediately after the instructions and 3 months afterwards period. The last two questions analyze in more detail the quantitative gains and qualitative change within and between groups on acquisition and long-term retention

1. Do intermediate foreign language teenage learners acquire more vocabulary knowledge through reading plus vocabulary-enhancing activities and narrow reading activities? If yes, are the target vocabulary items retained 3 months later?
2. Which instructional context is more instrumental to vocabulary acquisition and retention over a 3-month period?
3. What are the respective ratios of known words and unknown words on vocabulary acquisition and retention within and between groups?
4. Among those known words, what are the respective ratios of receptive and productive vocabulary within and between groups?

Receptive word knowledge in this study refers to learners' ability to recognize both the form and meaning of a target word, whereas productive word knowledge refers to their ability to write a target word in a sentence which is semantically appropriate and grammatically correct.

Method

1. Subjects

Subjects participating in this experiment were 50 male Chinese speakers of English as a foreign language at a senior high school in Taiwan. All of the participants took part in this experiment on a voluntary basis. The researchers obtained parental consent before allowing each student to sign up for one of the classes. All of them had already learned English in school settings for at least 5 years prior to the classroom-based experiment, and had passed either the Elementary or Intermediate Level of

General English Proficiency Test administered by Language Training and Testing Center in Taiwan (approximately between 500-523 in TOEFL score).

To ascertain that both groups' English proficiency was at the same level prior to different instructional treatments, the researchers performed a t-test on participants' last school final exam scores. The last English final exam score average for the Reading Plus Vocabulary-Enhancement Group (henceforth the RV group) was 74.56 (SD = 11.15) and that of the Narrow Reading Group (henceforth the NR group) was 73.84 (SD = 10.32). No significant difference existed between these two groups' English proficiency levels ($t = -0.237$, $p > 0.05$).

Study Design

The instructional treatments were a part of the summer session English course offered at the senior high school. After registering for the instructional treatments on a voluntary basis, students received the class schedule that clearly stated the dates, themes and activities of the chosen class. The class met two hours per week for a total of 10 hours spanning five weeks. Fifty lexical items selected as target words (See Appendix I), which were pilot-tested with another 60 students with the same English proficiency to ensure students' lack of knowledge about any of these words. Prior to the formal instruction, the participants took a pretest. Right after the 10-hour instruction, they took a posttest. Three months afterwards, the participants took a delayed post test. The following is a detailed description of the 10-hour in-class instruction of the RV and NR groups, the reading materials, measurement, scoring system, and interrater reliability. There were 50 target words for 50 students to work on, so that there was a total of 2500 words for the raters to score at each test. Thirty disagreements were found between the two raters at the pretest, twenty-six at the posttest and twenty-two at the delayed recall test. Therefore, the agreement rate was .99 for pretest, .99 for posttest and also .99 for delayed-recall-teat.

2. Instructional Treatments

Both RV and NR groups were taught by a female instructor who had nine years of teaching experience at senior high school. They met with the instructor 2 hours per week. For the first week, both groups read the main texts with target words in bold-face (See Appendix II for an example) to ensure that they "apperceive" (Gass, 1988) the target words. The teacher then conducted some reading-related activities (e.g., discussion, interpretation and answering questions), but did not provide systematic grammar instruction. The students were required to answer reading comprehension questions at home (See Appendix III) and check answers with the teacher when they met again the following week.

During the 2nd week, the RV group, after checking answers with the teacher, was required to complete a variety of vocabulary-enhancing exercises based on the target words from the given text. These exercises, ranging from matching Chinese definitions to target vocabulary items and choosing the most appropriate synonym from multiple choice questions to reorganizing words into sentences, tapped students' receptive knowledge and productive knowledge (See Appendix IV). Each target word appeared in the vocabulary exercises 3-4 times. In other words, students worked 3-4 times with each target word besides encountering it in the main texts. The instructor also checked answers with students to ensure their completion and comprehension of the vocabulary exercises. Afterwards, students began reading text 2 on theme 1 and were assigned to complete reading comprehension questions at home. The same instructional procedure repeated for the remaining weeks.

By contrast, the NR group was required to read 2-3 thematically-related articles after checking answers with the instructor during the second week (See Appendix V). These thematically-related materials were compiled and composed by the instructor in consultation with the researchers. Each target word appeared in the thematically- related texts 2-3 times to further expose the students to them through reading. After finishing reading the supplementary texts, they continued reading text 2 on theme 1 and were assigned to answer reading comprehension questions at home. The same instructional procedure repeated for the remaining 4 weeks. Table 1 summarizes the schedule of both instructional treatments and the readings and exercises for respective treatment.

Table 1-1 Schedule for Reading plus Vocabulary-Enhancement Activities

Week	Themes	Activities
		Introduction Signing a consent
1	Theme 1: Computer culture Text 1:Unmasking Virus Writers and Hackers	Doing Pretest Reading theme 1, text 1 Giving homework (theme 1, text 1)
2	Theme 1: Computer Culture: Text 2: Female Virus Writer Packs Punch	Checking the answers to the homework of theme 1, text 1 Doing more exercises on theme 1, text 1. Reading theme 1, text 2. Giving homework (theme 1, text 2)
3	**Theme 2:** **The Future of Medicine:** Text 1: Robotic Surgeons	Checking the answers to the homework of theme1, text 2 Doing more exercises on theme 1, text 2. Reading theme 2, text 1. Giving homework (theme 2, text 1)
4	Theme 2: The Future of Medicine: Text 2: Internet Rescue	Checking the answers to the homework of theme 2, text 1 Doing more exercises on theme 2, text 1. Reading theme 2, text 2. Giving homework (theme 2, text 2)
5	Theme 2: The Future of Medicine: Text 2: Internet Rescue	Checking the answers to the homework of theme 2, text 2 Doing more exercises on theme 2, text 2. Doing Questionnaires
5 (last day of the week)		Doing post-test
(3 months later		Doing delayed recall test

Table 1-2 Schedule for Narrow Reading

Week	Themes	Activities
		Introduction Signing a consent
1	Theme 1: Computer culture Text 1:Unmasking Virus Writers and Hackers	Doing Pretest Reading theme 1, text 1 Giving homework (theme 1, text 1)
2	Theme 1: Computer Culture: Text 2: Female Virus Writer Packs Punch	Checking the answers to the homework of theme 1, text 1 Doing supplementary reading on theme 1, text 1. Reading theme 1, text 2. Giving homework (theme 1, text 2)
3	**Theme 2:** **The Future of Medicine**: Text 1: Robotic Surgeons	Checking the answers to the homework of theme 1, text 2 Doing supplementary reading on theme 1, text 2. Reading theme 2, text 1. Giving homework (theme 2, text 1)
4	Theme 2: The Future of Medicine: Text 2: Internet Rescue	Checking the answers to the homework of theme 2, text 1 Doing supplementary reading on theme 2, text 1. Reading theme 2, text 2. Giving homework (theme 2, text 2)
5	Theme 2: The Future of Medicine: Text 2: Internet Rescue	Checking the answers to the homework of theme 2, text 2 Doing supplementary reading on theme 2, text 2. Doing Questionnaires
5 (last day of the week)		Doing post-test
(3 months later)		Doing delayed recall test

3. Reading Materials

Main texts. The reading materials were selected from authentic texts (Anderson, 2003a, 2003b) on the market in Taiwan. Drawing on three selection criteria--students' interest, instructional appropriateness, and linguistic difficulty and text length, the researchers and the instructor chose as the main texts four authentic articles on two themes—computer culture, and the future of medicine. The four articles were considered motivating to the subjects because the chosen themes matched those in their English texts used for the previous term. The level of difficulty was considered suitable given the ratio of new words in each article was all below 3%. The four main articles were pilot-tested with a comparable group of third-year students whose score average on reading comprehension of the texts was 75 (out of 100), suggesting that the texts' difficulty level was intermediate.

Thematically-related supplemental materials. The supplemental materials read by the NR group were compiled by both the instructor and the researchers. These supplementary readings were from a variety of printed and electronic resources. Each main text of the two themes was supplemented by two additional readings except for the 1st text of theme 1, which was supplemented by 3 readings. The average length of the nine supplemental readings was 706 words. The use of supplementary reading was to accentuate the effect of authentic reading and ensure that students had 2-3 additional encounters with the target words during reading. Table 2 summarizes the reading materials read by both groups.

Table 2 Instructional Treatment and Reading Materials

	Treatments					
	Reading plus Vocabulary-Enhancing Activities (RV)			Narrow Reading (NR)		
Themes	1 Computer culture	2 The future of medicine	RV WORD TOTAL	1 Computer culture	2 The future of medicine	NR WORD TOTAL
Main texts	(1) Unmasking virus writers and hackers (2) Female virus writer Packs Punch	(1) Robotic surgeons (2) Internet rescue		(1) Unmasking virus writers and hackers (2) Female virus writer Packs Punch	(1) Robotic surgeons (2) Internet rescue	
Instructional Treatment	Vocabulary exercises	Vocabulary exercises		Supplementary texts: (1.1) Virus writers and hackers (1.2) Who are the hackers? (1.3) Who are the virus writers? (2.1) Female virus writer Packs Punch (2.2) Virus girl finds hacker boyfriend	Supplementary texts: (1.1) Robotic surgeons (1.2) Robotic technology to help surgeons (2.1) Shaping ourselves through life experience (2.2) Ice bound	
Target Words	22	28	50	22	28	50

4. Test Instrument

The researchers employed the Vocabulary Knowledge Scale designed by Paribakht and Wesche (1997) to measure vocabulary acquisition and retention. For the sake of the present study, the researchers used a Chinese version of VKS (translated by the instructor) to enable subjects in both groups to perform self-analysis of the 50 target words prior to, immediately and three months after the instructional classes (Appendix VI).

Based on Paribakht and Wesche's (1997) proposed hierarchy of exercise types and Gass's (1988) framework, the VKS reflects a view of vocabulary acquisition as a multistage, iterative process, involving different levels and kinds of knowledge (Paribakht & Wesche, 1997). It can also reflect the changes in knowledge during relatively brief instructional periods in the present study. Its five-point scale measures students' receptive (categories III & IV) and productive (category V) knowledge about a specific word, which can verify actual knowledge against perceived knowledge.

Scoring

Following Paribakht and Wesche's (1997) criteria, a score of one to five points is awarded to each subject's VKS self-analysis of each target word. The scoring criteria are stated as follows:

(1) One point is given for words reported both unfamiliar and unknown.

(2) Two points are given for familiar words with unknown meanings. Students sometimes thought that they knew the target word, but mistook it for another word. For example, they thought "improvise" was "improve" and wrote the wrong translation "Jin Bu." In this case, they got two points.

(3) Three points are given if a synonym or translation of the target word is correct.

For example, the word "hail" can be a noun or verb. When being a noun, it means "small hard ball of ice falling from the sky like rain." When being a verb, it means "calling someone to attract their attention." Either answer got three points.

(4) Four points are given when the use of a word is semantically correct. For example, the sentence "the virus can <u>invasive</u> everyone's computer" got four points because it shows the students' correct semantic knowledge, which is inaccurately expressed in grammar. Invasive is an adjective, not a verb.

(5) Five points are given when the use of a target word is both grammatically and semantically correct, even if other parts of the sentence contain errors. For example, the sentence "There is an old man lives (living) in the shack" got a score of five, even the word "lives", a non-target word, was misused.

5. Interrater Reliability

To maintain consistency in scoring and to minimize any bias a rater could develop for a particular student's answers, the researchers, the instructor and her colleague served as three raters for the scoring of the VKS in this study. Raters independently scored each word according to the criteria established in Paribakht and Wesche (1997). Interrater reliability, measured in terms of how students were scored for each target word at pre-, post and delayed tests, was .99, .99, and .99 respectively.[1]

Results

The descriptive statistics of the pre-, post, and delayed test scores are reported in Table 3. The post-test scores were considered as scores of vocabulary acquisition, whereas those of the delayed test taken 3 months after the instructional treatments ended were treated as vocabulary retention scores.

Table 3 Descriptive Statistics of Pretest, Acquisition, and Retention Scores for RV and NR Groups

Group	N	Test	Mean	SD
		Pre	75.48	10.23
RV	25	Acquisition	176.96	32.02
		Retention	134.28	20.91
		Pre	79.36	13.87
NR	25	Acquisition	144.44	32.06
		Retention	120.84	15.50

6. Effectiveness of Each Instructional Treatment

To answer the first research question, which addressed the respective effect of RV and NR on learners' vocabulary development, a paired t-test was conducted to examine the differences between test scores within groups. Both groups served as their own controls. As shown in Table 2, the RV group gained more knowledge about the target vocabulary after the instructional treatment. The mean difference between the RV group's acquisition and pre-test scores (MD=101.48) indicated that students made significant vocabulary gains after instruction ($t = -15.67$, $p < .01$). In addition, the mean difference between retention and pre-test scores (MD=58.80) demonstrated that the RV group still retained significantly more word knowledge three months after the instructional treatment ended than they did prior to receiving instruction ($t = -14.50$, $p < .01$), although they also forgot a significant amount of vocabulary knowledge, as indicated by the significant mean difference between their acquisition and retention scores (MD=-42.68, $t = 8.45$, $p < .01$).

In a similar vein, NR group also made significant vocabulary gains after engaging themselves in reading supplementary materials (MD=65.08, $t= -11.13$, $p < .01$). They also retained significantly more lexical knowledge about the target words three months after the instructional treatment ended than they did before the instruction (MD = 41.48, $t = -15.45$, $p < .01$). Yet they also forgot a significant amount of vocabulary knowledge as shown in the significant mean difference between their acquisition and retention scores (MD=-23.60, $t = 4.48$, $p < .01$).

Table 4 Comparisons of Gains Within Groups

Group	Matched Sample	Mean Difference	SD	t
	Pre / Acquisition	101.48	32.38	-15.67**
RV	Acquisition / Retention	- 42.68	25.24	8.45**
	Pre / Retention	58.80	20.28	-14.50**
	Pre / Acquisition	65.08	29.23	-11.13**
NR	Acquisition / Retention	- 23.60	26.36	4.48**
	Pre / Retention	41.48	13.42	-15.45**

** $p < .01$

The results corroborated previous literature in that students gained in their lexical knowledge of the target words not only through reading plus vocabulary-focused activities but also through narrow reading activities (Laufer, 2003; Paribakht & Wesche, 1997; Rott, 1999). The findings further showed that three months after the instructional treatments ended, both RV and NR groups were able to retain some knowledge of the target words. The words students retained were significantly higher than those prior to the instructional treatments, suggesting the long-term effect of these two treatments.

Comparative Effects Between Groups

The second research question was to compare the effectiveness of the two instructional treatments RV and NR on vocabulary acquisition and retention. The researchers ran an "independent sample t-test" to compare the two groups' performances on pretest, acquisition and retention tests. As demonstrated in Table 3, RV and NR did not differ significantly on the pretest (MD=–3.88, t = -1.13, p > .01), demonstrating that the students' knowledge of the 50 target words was the same prior to the instructional treatments.

However, the mean difference between RV's and NR's VKS scores (MD=32.52) measured at the time of acquisition was significant (t = 3.59, p < .01), demonstrating that RV group acquired more knowledge about the target vocabulary than NR group. The mean difference between RV's and NR's scores (MD=13.44) measured at the time of retention 3 months after the instructions ended also reached significance (t = 2.58, p < .05), indicating that the RV group also retained significantly more lexical knowledge than the NR group.

Table 5 Comparisons of Gains Between Groups

Test	Mean Difference (RV/NR)	Standard Error	t
Pretest	-3.88	3.45	-1.13
Acquisition	32.52	9.06	3.59^{**}
Retention	13.44	5.21	2.58^{*}

$^{*}p < .05$ $^{**}p < .01$

Why did the RV group outperform the NR group on acquisition and retention tests despite their similar pretest scores? The vocabulary exercises may have been the key. Completing a variety of vocabulary exercises tapping different levels of processing capabilities such as recognition, interpretation, and production may have engaged the RV group in varying levels of cognitive processing. Given the variety and amount of exercises that the RV group completed during the instructional treatment, it logically follows that they had more opportunities to undergo a deeper mental processing of these target words, thus likely to enhance their vocabulary acquisition and retention.

By contrast, the NR group may not have particularly focused on vocabulary learning given the lack of vocabulary exercises. Although they encountered the target words 3-4 times (one during reading the main text, and 2-3 times in reading supplemental texts), they did not do any exercises except for answering multiple-choice or true/false reading comprehension questions accompanying the main text (cf. Paribakht & Wesche, 1997). As a result, they may have perceived understanding the gist of the texts as the goal of reading those articles and may not have paid attention to the target words despite encountering those bold-faced target words in meaningful contexts at least three times. Or they might have attended to those words, but inferred the meanings wrongly, suggesting that 3-4 exposures to words in meaningful contexts might not be adequate to assure correct interpretation of some word meanings.

Quantitative Gains in Known Vocabulary Within and Between Groups

The third research question examined the quantitative gains in known words within and between groups on pre-, acquisition and retention tests. According to the VKS scoring measure, students reporting not having seen a target word (category 1) or having seen it but not known its meaning (category 2) would receive 1 point and 2 points respectively. In other words, students who did not possess any lexical knowledge about the 50 target words might have gained a score up to 100 points (50*2) on the VKS measure. In order to fully understand the effects of both instructional treatments on students' lexical knowledge development of the 50 target words, it is crucial to detail the quantitative gains in known words for both groups on pre-, acquisition, and retention tests.

To find out the number of words known to both groups, the researchers collapsed each group's VKS scores in categories 1 and 2 under the category of "unknown word" and those from categories 3 to 5 under that of "known word." As shown in Table 4, there was a significant 68.59% increase in known words for the RV group between the pre- and acquisition tests ($t = 374.025$, $p < .01$). For the NR group, there was also a significance 45.20% increase ($t = 79.903$, $p < .01$). As had been expected, both groups regressed on the retention test. There were a significant 27.44% vocabulary loss for the RV group ($t = -81.665$, $p < .01$) and another 23.20% loss for the NR group ($t =-22.324$, $p < .01$) between the acquisition and retention tests. Despite such a loss, there were still a significant 31.12% ($t = 137.578$, $p < .01$) and a 22% ($t= 26.176$, $p< .01$) increase for the RV and NR groups in vocabulary gain between the pretest and the retention test, suggesting a long-term effect of both instructional treatments on subjects' knowledge of the target vocabulary.

Table 6 Percentages of Unknown and Known Words on VKS Scale Within and Between Groups

Group	Variable	Test		VKS Scoring Category	
				Unknown (1-2)	Known (3-5)
RV	Vocabulary	Pretest	percentage	96.08%	3.92%
			(frequency)	(1201)	(49)
		Acquisition	percentage	27.52%	72.48%
			(frequency)	(344)	(906)
		Retention	percentage	64.96%	35.04%
			(frequency)	(812)	(438)
NR	Vocabulary	Pretest	percentage	95.92%	4.08%
			(frequency)	(1199)	(51)
		Acquisition	percentage	50.72%	49.28%
			(frequency)	(634)	(616)
		Retention	percentage	73.92%	26.08%
			(frequency)	(924)	(326)

A closer examination of the percentage distributions of unknown/known words on the acquisition test between RV and NR groups revealed the relative effectiveness of the two groups on assisting students in knowing the meanings of target vocabulary. For the RV group, the percentage distribution between unknown words and known words on the acquisition test was 27.52% to 72.48%, a significant difference ($t = 36.609$, $p < .01$). For the NR group, however, the percentages of unknown words (50.72%) and known words (49.28%) approximated each other ($t = -1.283$, $p > .05$). This insignificant difference demonstrated that the NR group failed to comprehend the other half of the target vocabulary despite a significant improvement on the pretest ($t = 79.903$, $p < .01$). In addition, the RV group made significant more gains on known words than the NR group on the acquisition test ($t = -36.500$, $p < .01$) and the retention test ($t = -6.872$, $p < .01$), despite the fact that both groups forgot a significant number of words on the retention test. These findings, coupled with the previous comparison of the composite VKS scores between the RV and NR groups, lend further support to the superior effectiveness of reading with vocabulary-focused activities over narrow reading on vocabulary acquisition and long-term retention.

Qualitative Change in Known Vocabulary Within and Between Groups

The last research question addressed the impact of the two instructional treatments on the RV and NR groups' gains in receptive and productive knowledge of the 50 target vocabulary. In order to answer this question, the researchers collapsed VKS scoring categories 3 (a correct synonym or translation is given) and 4 (a word is used with semantic appropriateness in a sentence) under the category of "receptive" knowledge and that of 5 (a word is used with semantic appropriateness and grammar accuracy in a sentence) under "productive" knowledge.

Table 5 shows that there were a significant 32.32% increase in receptive word knowledge ($t = 31.179$, $p < .01$) and a significant 36.24% gain in productive word knowledge ($t = 31.180$, $p < .01$) on the acquisition test for the RV group. For the NR group, there was also a significant 26.88% increase in receptive ($t = 28.583$, $p < .01$) and another 18.32% gain in productive knowledge ($t = 33.145$, $p < .01$). As had been predicted, an overall trend of word loss was evident. There was a significant 19.04% loss in receptive ($t = -11.008$, $p < .01$) and another significant 18.40% loss in productive knowledge ($t = -15.798$, $p < .01$) of the target words between the acquisition and retention tests for the RV group. For the NR group, there was a significant 15.02% loss in receptive ($t = -19.623$, $p < .01$) and another 8% significant loss in productive knowledge ($t = -10.565$, $p < .01$). Despite such significant losses in receptive and productive for both groups, they were still able to maintain significant gains in receptive and productive word knowledge on the retention test. For the RV group they maintained a significant 13.28% increase in receptive knowledge ($t = 12.483$, $p < .01$) and a significant 17.84% gain in productive knowledge ($t = 21.723$, $p < .01$). For the NR group, there were a significant 9.68% increase in receptive knowledge ($t = 14.369$, $p < .01$) and a significant 10.32% gain in productive knowledge ($t = 23.241$, $p < .05$). These results suggest a long-term effect of both instructional treatments on subjects' receptive and productive knowledge of the target words.

Table7 Percentages of Receptive and Productive Words Within and Between Groups

Group	Test		Vocabulary	
			Receptive (3 & 4)	Productive (5)
RV	Pretest	percentage	2.80%	1.12%
		(frequency)	(35)	(14)
	Acquisition	percentage	35.12%	37.36%
		(frequency)	(439)	(467)
	Retention	percentage	16.08%	18.96%
		(frequency)	(201)	(237)
NR	Pretest	percentage	2.08%	2.00%
		(frequency)	(26)	(25)
	Acquisition	percentage	28.96%	20.32%
		(frequency)	(362)	(254)
	Retention	percentage	13.76%	12.32%
		(frequency)	(172)	(154)

Yet a closer look at the frequency distributions of receptive and productive knowledge between groups disclosed the superior effectiveness of RV over NR in facilitating both receptive and productive word knowledge on both acquisition and retention tests. With regard to the acquisition test, the RV group made significantly more gains than the NR group on both receptive ($t = -3.487$, $p < .05$) and productive ($t = -11.315$, $p < .01$) word knowledge of the target words, demonstrating their superior ability to supply correct synonyms or translation equivalents and to produce target words in semantically appropriate and grammatically correct sentences. In terms of the retention test, the RV group made more nonsignificant improvements on receptive word knowledge ($t = -1.789$, $p > .05$) and more significant gains on productive word knowledge than the NR group ($t = -8.187$, $p < .01$). These findings suggested that the RV instructional treatment was significantly more instrumental to enhancing students' receptive and productive word knowledge and significantly more conductive to retaining their productive word knowledge.

Discussion

The findings that students of the present study gained in their lexical knowledge of the target words not only through reading plus vocabulary-focused activities but also through narrow reading activities are not new, given similar reports in respective research strand (Laufer, 2003; Paribakht & Wesche, 1997; Rott, 1999). Nor are surprising the significantly more word gains reported in the reading plus vocabulary- enhancement activities than those in reading thematically-related articles. Nevertheless, the present study expanded extant research by specifying the type of word knowledge acquisition and retention each treatment is more instrumental to enhancing on longer terms in a single study. The findings were based on measurable score gains on higher levels of receptive and productive word knowledge through a testified measure (cf. Laufer, 2003; Rott, 1999) and a more stringent assessment standard (cf. Paribakht & Wesche, 1997).

Employing the VKS measure to assess students' word knowledge, Paribakht and Wesche (1997) found a large number of previously reported unknown words to "have moved to category 2 (recognition level knowledge) for the reading only treatment, while substantially more have moved to higher categories (i.e., 3, 4 and 5) for the reading plus treatment" (p. 189). However, they failed to further analyze the gains in different types of word knowledge for both treatments. The current study was able to present a more detailed picture in a single study about students' receptive and productive word knowledge gains by further examining the score distributions of different types of word knowledge. This study showed that the RV treatment was significantly more effective than the NR treatment in enhancing students' productive and receptive word knowledge on the acquisition test. With regard to the retention test taken 3 months after the instructional treatments ended, the RV treatment was again more significantly effective than the NR treatment in assisting students in retaining productive word knowledge. These findings lent support to Rott's (1999) claim that "enhanced reading conditions" lead to more gains in vocabulary acquisition and further showed that the former's superiority was still evident even 3 months after the instructional treatments ended.

The latter finding is significant in that no previous research design has as yet included a delayed retention test 3 months after treatments ended. Some included a delayed post test in their research designs, yet with intervals no more than 1 month (Laufer, 2003; Rott, 1999). Others reported score gains in students' vocabulary knowledge acquisition rather than retention despite a longer span of instructional treatments (Paribakht & Wesche, 1997).

Another significance of the findings lies in the fact that the current study used a more refined instrumentation (cf. Laufer, 2003; Rott, 1999) and employed a more stringent standard to assess subjects' receptive and productive word knowledge (cf. Paribakht & Wesche, 1997). Neither Laufer's or Rott's test instrumentations were sensitive and refined enough to capture the iterative process of lexical development. Although Paribakht and Wesche (1997) used a more refined instrumentation-VKS-to test subjects' different degrees of vocabulary knowledge, they employed a lax standard to evaluate subjects' word knowledge. They classified scoring category 2 (words familiar but unknown) as scores of word recognition. Recognizing the form of a target word without knowing its meaning showed rather limited receptive word knowledge. Treating such restricted knowledge as word recognition appears to conflict with the definition of recognition that "association of the written target word form with at least *one of its meanings* [italics mine]" is required (Wesche & Paribakht, 2000: 200).

The current study considered gains in students' receptive word knowledge when they successfully supplied a correct synonym or translation equivalent (VSK scoring category 3) and when they used the target word in a semantically appropriate way (VKS scoring category 4); and deemed as gains in students' productive word knowledge when they produced target words in a semantically and grammatically correct sentence (VKS scoring category 5). In a sense, the current findings of students' word gains represented a higher degree of both receptive and productive word knowledge because partial receptive (words familiar but meaning unknown) and incomplete productive knowledge (semantically appropriate but grammatically inaccurate) was excluded from scores of receptive and productive word knowledge respectively. They demonstrated the relative effectiveness of reading plus focused vocabulary activities and narrow reading activities on students' higher level of receptive and productive vocabulary knowledge, which, to the researchers' knowledge, has rarely been reported before.

Finally, the significance of this study lies in the fact that it simulated a more "natural" setup for the narrow reading group given that the researchers eliminated the request on students to complete reading comprehension questions after finishing supplemental readings (Paribakht & Wesche, 1997). Also the readings were thematically related to the texts used at school and the average length of reading materials approximate one another. Under such "simulated" naturalistic setup, the study demonstrated the effects of reading plus focused vocabulary activities and narrow reading activities on retention of a large number (i.e., 50) of conceptually more challenging vocabulary in longer narrative and expository texts (average length 706 words) over 3 months. Previous research used either contrived shorter, easier reading materials containing rich contextual clues (Rott, 1999) or more authentic materials yet with fewer target words (Paribakht & Wesche, 1997). The present research demonstrated the superior effectiveness of reading plus focused vocabulary activities not only on recalling easy vocabulary in simple texts but also on recalling cognitively more challenging vocabulary in longer narrative and expository essays.

Conclusion

The purpose of this quasi-experimental study was to compare the effectiveness of reading plus vocabulary-enhancement activities and narrow reading on vocabulary acquisition and retention measured by VKS among EFL secondary school students. The results showed that the RV group significantly outperformed the NR group on acquisition and retention tests and demonstrated significantly more productive knowledge on the acquisition test and more receptive knowledge on the acquisition and retention tests. This finding has practical implication for EFL vocabulary instruction. It shows that intensive vocabulary exercises might be a better option for EFL teachers who are bent on enhancing students' receptive and productive word knowledge acquisition and long-term retention, especially for teaching the frequently used words to a threshold level (3000-5000 word families) or for specific purposes. These vocabulary enhancement activities can enable students to focus their attention on specific vocabulary items and help them to understand the word meanings and functions, thus enhancing their vocabulary acquisition. The finding in this study also showed that the use of varied vocabulary exercises derived from Gass' (1988) classification theory in the RP group can provide multiple and successful encounters with target words. Therefore, teachers can develop lexical instruction that would help students focus their attention on a selected set of words for additional practice and to increase their vocabulary knowledge during a short period of time.

As is with other research, this study suffers from some limitations, despite its said methodological improvements on previous research. First, the findings were based on vocabulary acquisition and retention among male students only. Whether female students would react to the instructional treatments and perform differently from their male counterparts awaits further research. Second, the subjects were not randomly assigned to each treatment. Instead, they signed for respective treatments on a voluntary basis. A potential impact of learner involvement may have inadvertently exerted some influence on present findings. In fact, learner motivation has been identified as one crucial variable in Hulstijn and Laufer's (2001) Involvement Load Hypothesis for L2/EFL vocabulary learning. Further research needs to compare the effects of each instructional treatment on learners with varying levels of motivational involvement.

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Appendix I A List of 50 Selected Target Words

malicious	predominantly	perceive	stereotype
dominate	academic	relinquish	motivation
random	abusive	shift	justify
mangle	immaculate	cordially	vandalism
attachment	cottage	feminist	ethic
cunning	approve	make-believe	incision
organ	trauma	undergo	relay
eliminate	invasive	instrument	slit
console	magnify	hail	mimic
anticipate	inaccessible	conventional	sterile
improvise	staff	colleague	adhesive
numb	fluid	shack	confine
ailing	lump		

Appendix II An Example of the Main Texts

Theme 1: Computer Culture

Text 1. Unmasking Virus Writers and Hackers

When we think of the people who make our lives miserable by hacking into computers, or spreading **malicious** viruses, most of us imagine an unpopular teenage boy, brilliant but geeky, venting his frustrations from the safety of a suburban bedroom.

Actually, these **stereotypes** are just that—stereotypes—according to Sarah Gordon, an expert in computer viruses and security technology, and a Senior Research Fellow with Symantec Security Response. Since 1992, Gordon has studied the psychology of virus writers. "A hacker or a virus writer is just as likely to be the guy next door to you," she says, "or the kid at the checkout line bagging your groceries. Your average hacker is not necessarily some Goth type dressed entirely in black and sporting a nose ring: she may very well be a 50-year-old female."

The virus writers Gordon has come to know have varied backgrounds; while **predominantly** male, some are female. Some are solidly **academic**, while others are athletic. Many have friendships with members of the opposite sex, good relationships with their parents and families; most are popular with their peers. They don't spend all their time in the basement. One virus writer is a poet and a musician, another is an electrical engineer, and others work for a university quantum physics department. You wouldn't pick them out of a lineup as being the perpetrator.

Hackers and virus writers are actually very different, distinct populations. "Hackers tend to have a more thorough knowledge of systems and a more highly developed skill set," Gordon says, "whereas virus writers generally take a shallower approach to what they're doing." Hackers tend to have a much deeper knowledge of individual applications and are still regarded as being somewhat "sexy" in today's counterculture, while virus writing is looked down upon, mostly for its **random** damage and lack of required skill.

Their **motivations** may also differ. While both hackers and virus writers are initially attracted by the technical challenge, hacking is more about power and control. When you're hacking and you get into a system, you remain involved with that system—you take it over and **dominate** it. On the other hand, once a virus writer releases a program into the wild, the virus goes off and keeps on making copies of itself independently of the author. It's not as intimate or connected a relationship as between a hacker and the computer—the virus writer **relinquishes** control and becomes disassociated from the actual activities he or she has set in motion.

Gordon explains that people write viruses for a number of reasons. Some may **perceive** it as a technical challenge, even though writing a virus is actually very easy. It can take two minutes or less, depending on the application you're using. And the part of the program that makes it viral, i.e., that makes it **replicate** itself, is generally very simple—just one or two lines of code. It's much more complicated to write a useful application than it is to write a virus.

Younger virus writers like to be part of a group. They look for peer identity, which is important to them. Or it may be a way to make a social statement. If you're a young person who doesn't have a lot of power and you can assert yourself with a political statement in a virus that travels all around the world, you might think you're making a difference, imagining yourself a modern-day social activist. "Gordon says, "It's a big deal to them when they see it in CNN. They feel like they've reached the world."

"Furthermore," Gordon says, "most virus writers don't understand the damage they do. Most of them just don't make the connection between actions and their consequences." This is understandable to a degree because the computer has introduced a **shift** in the way we communicate. Desensitization occurs; you miss all the visual cues, the contextual clues, and you don't see the impact you're having on another person. We've all gotten e-mail from people who are actually **abusive** in writing when they'd never speak to us that way in person.

People who make mischief with their computers seem to distance themselves from their actions. They **justify** their behavior with the **rationale** that "It's not really wrong, it's not illegal." Or they may tell themselves, "Well, everybody has antivirus software so if I send this out it won't really hurt anybody."

Fortunately, social pressure is changing the impressions people have of hackers and virus writers. Their own peers are beginning to say to them, "This is not cool." And, while it is still widely legal to make viruses publicly available, Gordon's research has shown a decrease in acceptance of online publication of viruses and heroes. But now the press has changed its tune. They no longer portray virus writer as brilliant and misunderstood. "We're seeing the media start to turn around," she says, "We're getting the message out to young people that writing viruses really isn't cool.

Appendix III An Example of Reading Comprehension Exercises Accompanying the Main Text

Theme 1: Computer Culture **Text 1. Unmasking Virus Writers and Hackers**

Choose the best answer for each question or statement.

1. The average hacker tends to be _____.

   A. a stereotypical geek B. socially frustrated

   C. more often male D. scientifically inclined

2. What does the reading tell us about the social background of virus writers?

   A. They come from many different backgrounds.

   B. Most of them work in grocery stores.

   C. Female virus writers like to dress in black.

   D. They are very antisocial.

3. Which of the following statements is not true about the differences between hackers and virus writers?

   A. Hackers tend to possess more technical knowledge.

   B. Virus writers take a shallower approach to what they do.

   C. Hackers have more knowledge of program applications.

   D. Hackers are more attracted by the technical challenge of what they do.

4. One main motivation that drives a hacker is _______.

   A. power and control B. it is easier than writing virus

   C. fame D. intimacy

5. All of the following are reasons given for writing a virus except ______.

   A. it is a technical challenge B. peer identity

   C. it is easy to write D. replicating it is simple

6. What do younger virus writers hope to achieve?

   A. financial wealth B. political power

   C. social acceptance D. social change

7. Which of the following is given as a reason for the disassociation between action and consequence?

   A. Virus writers do not communicate with hackers.

B. Virus writers have changed the way we communicate.

C. It is easier to be abusive in e-mail messages.

D. Computers distance us from other people's feelings.

8. How is social pressure changing the view of hackers and virus writers?

A. By making it appear cool to be a hacker.

B. By making it appear not cool to spread viruses.

C. By promoting hacking and virus writing in the media.

D. By increasing the acceptance of hackers and virus writers.

Appendix IV An Example of Vocabulary Enhancement Exercises

Theme 1: Computer Culture Text 1. Unmasking Virus Writers and Hackers

I.

A. Look at the list of words from the reading. Match each one with a definition on the right.

1. _____ malicious	a. something conforming to a fixed or standardized pattern
2. _____ predominantly	b. mostly; being the most noticeable or largest in number
3. _____ relinquish	c. to influence or control something or someone
4. _____ stereotype	d. scholarly; not technical or practical
5. _____ dominate	e. wanting to cause harm to others
6. _____ academic	f. gives up or surrenders something

B. Now complete the sentences below using the vocabulary from the above column. Be sure to use the correct form of each word.

1. The ________ of naughty students are always the same to a lot of teachers; they are disobedient, misbehaving, disorderly and always causing trouble.
2. For years the workforce in this company was ________ by men, now there are roughly equal numbers of men and women.
3. Though top executives in many international corporations are still _______ male, an increasing number of women are attaining high-level positions.
4. In most ball games, one player or team wins when their opponent _________ control of the ball.
5. History, economics are _________ subjects; typing and bookkeeping are commercial subjects.
6. Some people thought Carly's attempts to get prompted over Sunil were purely _______. However, others viewed her actions as healthy competition.

II.

A. Look at the list of words from the reading. Match each one with a definition on the right.

1. ____ motivation	a. lacking a definite plan, purpose, or pattern
2. ____ random	b. view; interpret something in a certain way
3. ____ abusive	c. incentives or drives to do something
4. ____ shift	d. change or move from one position or direction to another
5. ____ justify	e. characterized by wrong or improper use or action

6. ____ perceive f. show that something or somebody is right, reasonable or just

B. Now complete the sentences below using the vocabulary from the above column. Be sure to use the correct form of each word.

1. The workers have good ______ for working hard because the company provides a large bonus.
2. He may _______ himself as a loser because he flunked math exam again.
3. The way the books were arranged seemed completely ______, without any order.
4. The _________ financial practices of the corrupt African government led to the poverty of the people.
5. A ________ of the wind made the hot-air balloon hard to control.
6. The pursuit of good ends does not _______ the employment of bad means.

III. Translate the Chinese words into the English vocabulary from the reading.

1. ______________	惡意的	7. ______________	動機
2. ______________	佔大部分的	8. ______________	證明是正當
3. ______________	認為	9. ______________	放棄
4. ______________	任意的	10. ______________	模式化、刻板印象
5. ______________	支配、控制	11. ______________	濫用的
6. ______________	學術的	12. ______________	移動、改變

IV. Rearrange the order of words into a complete sentence.

1. an / history / subject / is / **academic**

____

2. have / good / **motivation** / the students / for / learning

____

3. **justifies** / the end / the means

____

4. may / himself / a loser / **perceive** / he

____

5. **abusive** / the / poor child / treatment / receives

____

Appendix V An Example of Supplemental Reading

Theme 1: Computer Culture

Text 1: Unmasking Virus Writers and Hackers

Supplementary Reading 1:

Virus Writers and Hackers

Most people think that the majority of virus writers and hackers are bored, unusual, and abnormal young men who do not fit in society or who are not accepted by society. They may feel frustrated or be disappointed by the people around them. As a result, writing viruses or hacking into computers is a way to vent their frustration or lessen their disappointment; that is to say, by doing so, they can find an outlet or a way to release their strong feelings or depressed emotions.

These thoughts are perhaps stereotyped. Nowadays, virus writers or hackers are not always **stereotypes**—fixed or conventional forms without individuality. Actually, according to Sarah Gordon, an expert in computer viruses and security technology, and a Senior Research Fellow with Symantec Security Response, these people are just like normal people, living in every walk of life, having different backgrounds. While they are **predominantly** male, some are female. Most of these people are young, but some are old. Some are **academics** who teach or study in schools or colleges, such as professors, instructors, or college students. While others are athletic who are physically strong and active in sports, many have very good relationships with their family, friends and peers. They do not have any particular excuse for committing a crime or doing anything offensive to be a **perpetrator**. Therefore, it is very hard for a person to recognize these types.

There are many differences between hackers and virus writers. First of all, hackers are likely to have more knowledge of systems and applications, while virus writers are regarded as being not so knowledgeable and tend to cause **random** damage to others without consideration. Hence, Gordon **portrays that** virus writers seem to be easily looked down upon while hackers appear to be more fancy and "sexy".

Secondly, their intentions or **motivations** are also different. When hackers hack into a computer, they like to take it over and **dominate** it; therefore, hacking is more about power and control. On the other hand, virus writers send out viruses without having any control over them. Once virus writers release a **malicious** virus into computers, the virus will **replicate** itself independently, continuing to make copies without the virus writer's control. The virus writers then give up or **relinquish** control and become separated from the activities that the virus is performing.

Gordon explains that people write viruses for two reasons. First, they may **perceive** writing viruses as a technical challenge and enjoy the process of writing them. Second, they may think that writing viruses will make them famous and make other people recognize them. By doing so, they can assert themselves and feel like they are making a difference.

The truth is, writing a virus is very easy. It may take only two minutes to create one. As well, most virus writers don't know the damage they will cause others. This is understandable because in modern times, computers change the way we communicate. Using the computer to communicate with one another, we cannot know exactly what happens in other people's environments or setting. That is how desensitization occurs. That is to say, the **shift** in methods of communication causes us to become less sensitive. This is due to the absence of contextual clues. Moreover, some people rely too much on e-mail and don't use them properly or correctly. In this way, they are **abusive** when using them and actually make things worse.

Virus writers usually **justify** their mischief by saying that writing viruses is not illegal and, besides, everybody has anti-virus software to protect their computers now. These reasons or **rationales** are hard for people to accept or tolerate even though they insist that their behaviors are right and reasonable.

Fortunately, people now have changed their impressions about hackers and virus writers. They don't view them as geniuses or heroes; and no longer consider them to be very mysterious, smart or brilliant. In fact, they think they are not cool at all.

Appendix VI Vocabulary Knowledge Scales – Chinese Version

VKS elicitation scale-- self-report categories

I. I don't remember having seen this word before.

（我不記得曾看過此字。）

II. I have seen this word before, but I don't know what it means.

（我曾看過此字，但我不知道它的意思。）

III. I have seen this word before, and I think it means ___________________.

(synonym or translation)

（我曾見過此字，而且我想它的意思是？。可以用英文同義字或中文回答。）

IV. I know this word. It means ______________________. (synonym or translation)

（我認識這個字，它的意思是？。可以用英文同義字或中文回答。）

V. I can use this word in sentence: ____.

(Write a sentence.) （我會用此字在句中， 請寫一個句子。）

(If you do this section, please also do Section IV.)

（如果你寫這一題，也請你寫 IV 題）

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補充閱讀對台灣以英語為外語學習者在英文字彙習得與保存的成效

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摘要

研究顯示大量閱讀可無意間促進字彙習得。但是台灣大部分的英語學習者並未能大量閱讀英語讀物。本研究旨在比較「閱讀加字彙練習」與「窄讀」（大量閱讀有關同一主題的文章）兩種方式對台灣高中生在英文字彙習得與保存的成效。五十位英文程度中級的高三學生，分別接受前述兩種教學方式，為時五週共十小時。「閱讀加字彙練習」組除了閱讀文章外，另作不同的單字練習；「窄讀」組除閱讀相同文章外，還閱讀與主題相同之文章二至三篇。實驗測試工具為中譯版的「單字知識等級表」。結果顯示：「閱讀加字彙練習」組的字彙習得與保存顯著地贏過「窄讀」組。在細項方面：「閱讀加字彙練習」組所認識的字彙多於窄讀組；能正確使用的字彙亦顯著地多於「窄讀」組。

關鍵字：字彙練習、字彙習得與保存、以英語為外語學習者、台灣