



English Learners' Incidental Vocabulary Acquisition in the Video-based CALL Program

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Bio Data

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Abstract

This study investigated the effects of video-based computer assisted language learning (VBCALL) program on English learners' incidental vocabulary acquisition and further explored the differences in vocabulary learning between English learners with high and low English reading and listening proficiency. The participants in this study were 82 university freshmen. Based on the results of an English proficiency test, three English proficiency groups were set up: (1) 44 participants with high reading and high listening English proficiency (the RHLH group), (2) 20 participants with high reading and low listening English proficiency the RHLL group), and (3) 18 participants with low reading and high listening English proficiency (the RLLH group). All participants completed five practice sessions, five vocabulary follow-up tests, and vocabulary pre- and post-tests. Quantitative analysis was conducted in terms of three proficiency groups. The results demonstrated that RHLH, RHLL, and RLLH groups' vocabulary post-tests were both higher than those of their pre-tests. Paired *t*-test results show that RHLH and RHLL groups respectively performed significantly better in the vocabulary posttest. One-way ANOVA results demonstrate that in the vocabulary follow-up tests, the total scores revealed significant differences between the RHLH and RLLH groups. The qualitative interpretation was presented in terms of the participants' one-on-one interview response.

Key Words: English listening proficiency, English reading proficiency, incidental vocabulary acquisition

Introduction

Current development in information technologies has resulted in rapid advances in the application of instructional and educational technology. In an instructional situation, instructors

cannot just rely on advanced educational technology to conduct teaching effectively; they still need efficient multimedia materials. By using effective materials, the materials can meet the wants and needs of learners of different backgrounds in different settings (Tomlinson, 1998). To develop efficient multimedia materials, some features that can facilitate language learning should be integrated into materials. These may include multimedia presentation formats and learner target language proficiency. This study will focus on how to deduce these features. What is new about the present study is that the learner's reading and listening proficiency is considered simultaneously to examine the effect of video-based CALL program.

The Development of CALL Programs

Technological advancements have deeply affected the methodology of education in general and foreign/second language in particular in which computers are at the heart of this process. Computers have been used for language teaching since the 1960s, and nowadays this advanced technological equipment has become widespread in schools and language institutions; moreover, their uses dramatically change the way of foreign/second language learning and teaching (Warchauer, 1996).

The development of CALL can be divided into three main stages: behavioristic CALL; communicative CALL; and integrative CALL (Warchauer & Healey, 1998; Candlin & Hall, 2005). Behavioristic CALL was developed in the 1950s and implemented in the 1960s and 1970s. CALL in this stage was viewed as a "mechanical tutor, which never grew tired or judgmental and allowed students to work at an individual pace" (Warchauer & Healey, 1998, p. 57). The second stage, communicative CALL, emerged in the late 1970s and early 1980s focusing on the communicative activities of languages. At this time, teachers tended to focus on pedagogical implication, i.e. meaning was stressed over form. Also, grammar teaching shifted to implicit instruction, in contrast to explicit instruction which was the previous norm. In the classroom instructional activity, the teacher encouraged students to generate sentences rather than just imitate prefabricated language. The concept of CALL is that the computerized programs do not provide language material but enable the learners to understand and use the language (Warchauer & Healey, 1998). The third stage, integrative CALL, began from the late 1980s and early 1990s. CALL was applied to integrate the various skills of language learning and use, such as communication in the social context, and task-based, project-based, and content-

based instruction in an authentic environment (Warchauer & Healy, 1998). More recently, CALL allows for a combination of sound, graphics, text, and video presented in one computerized program and further facilitates efforts to teach four language skills, including listening, speaking, reading, and writing. Multimedia researchers emphasized that the mixture of on-screen text, sound, and still and dynamic images improved language acquisition (Hubbard, 2009; Erben, Ban, & Castañeda, 2009; Jones, 2004). In this way, language learners have access to various sources of verbal and nonverbal information and use it for academic and communicative purposes.

Video Instruction

The inclusion of video clips in teaching is becoming increasingly dominant in the second language (L2) learning curriculum. This reform reflects the acknowledgement that audio and visual information aids language learning. For the past two decades, Mayer and his colleagues have been investigating the nature of multimedia learning with a goal of building a research-based theory of how people learn from words and pictures (Mayer & Anderson, 1992; Mayer & Gallini, 1990; Mayer, 2005). They received fruitful results and provided solid evidence that multimedia materials can be used to facilitate learners' text comprehension effectively, especially in science education (Mayer & Moreno, 1998; Moreno & Mayer, 1999).

Video, a kind of multimedia material, consists of verbal and nonverbal presentations displaying simultaneous images, narration and, on-screen text (Mayer, 2002). Comparing video with traditional English teaching materials such as paper-printed textbooks and listening dominant materials, it can be found that animation and picture-like dynamic images represent the essential difference between video and traditional English materials. From a learning perspective, video so far has been examined to see whether it can improve learning. The research on video yields mixed and contradictory results, with actual effects of video ranking from highly beneficial to detrimental to learning.

As Mayer and Gallini (1990) emphasized, an illustration can be worth ten thousand words. Canning-Wilson and Wallace (2000) claimed that video can be a communicative media contributing to the understanding of the target language culture by providing authentic language input and increasing contact in various ways with native speakers of the target language through video viewing. Native speakers' oral communication in authentic target language contexts can be introduced into the classroom. The benefits of using video in second language educational

settings have also been described (Çakir, 2006; Hemei, 1997; Rhodes & Puhfahl, 2003).

In contrast, some studies showed the disadvantages of video as an instructional tool. For example, research findings that are related to the effectiveness of narrative instructional video are ambiguous (Fisch, 2000). In addition, Caspi, Gorsky, and Privman (2005) reported that students might feel frustrated by using videos as a learning tool because the tasks involved in video instruction include hearing, watching and writing; these tasks were too demanding and thus resulted in students' negative feelings toward the medium. Therefore, there is a need to conduct a study systematically examining the effects of video on English learning.

L2 Vocabulary Acquisition

The fact that individuals differ in their vocabulary knowledge may result in successful and unsuccessful text comprehension. Researchers in L2 vocabulary acquisition and use may agree that L2 vocabulary knowledge is essential in L2 text comprehension (Laufer, 1997; Nassji, 2003; Nation, 2001; Read, 2000). L2 learners who have limited vocabulary knowledge are less likely to be able to develop advanced levels of reading, listening, writing and speaking skills in the target language. Given the important role of vocabulary in language learning, researchers now investigate efficient ways and ideal environments to enhance vocabulary learning.

One such environment is offered in CALL programs where multimedia makes it possible for students to learn vocabulary aided by sounds, pictures, and even video. A number of researchers have discussed the effects of presenting information using multimedia on L2 vocabulary acquisition (Akbulut, 2007; Kim & Gilman, 2008). In general, the results of these studies show that text along with video, pictures, and graphics fosters L2 vocabulary acquisition. For example, Akbulut (2007) investigated immediate and delayed effects of different hypermedia glosses on Turkish students' incidental vocabulary acquisition. The results showed that students having access to word definitions along with pictures and short video clips achieved significantly higher vocabulary scores than those assigned to the definition only groups. In a study of 172 Korean students, Kim and Gilman (2008) reported that information presented with visual text and supplementary graphics, or with visual text supplemented by spoken text and graphics could facilitate students' vocabulary acquisition the best.

Earlier research also shows that the material combining words and pictures makes it much easier for learners to remember the words. Jones (2004) investigated L2 vocabulary recognition

and recall from one control group and three treatment groups that provided written, pictorial, or both written and pictorial annotations while listening. She found that the pictorial and written annotations group recalled more vocabulary than those without access to written annotations. Vocabulary recognition and recall would be more effective if new words were placed in a context, using sound and image combination. Furthermore, Hu and Deng (2007) indicated that multimedia could improve students' ability to memorize words because multimedia transmitting information through auditory and visual modalities attracted learners' attention, and accordingly improve their word retention.

For the past decades, video has been applied as a teaching resource to enhance English learners' vocabulary learning. In such a video-based environment, the learner is required to process information presented in visual and audio modes. To learn vocabulary successfully, it is assumed that the learner should be skilled at reading and listening. If the learner cannot process visual and audio information effectively, the achievement of multimedia instruction can be quite limited. The learner's reading and listening ability plays an important role and has great potential for successful vocabulary learning. However, there is little research pertaining to examining its effect on English learners whose reading and listening abilities differ. The results of the study contribute to knowledge of vocabulary learning through a video-based CALL program and better guide instructional practice for visually and aurally diverse learners.

This study will firstly investigate the effects of video-based computer assisted language learning (VBCALL) program on L2 learners' incidental vocabulary acquisition. Furthermore, it will explore how authentic video clips foster incidental vocabulary acquisition of L2 learners with high and low English proficiency in reading and listening. The following research questions guided the study:

1. Are there significant differences between the participants with different English reading and listening abilities in incidental vocabulary acquisition?
2. How does the VBCALL program facilitate vocabulary acquisition for learners with different English reading and listening abilities?

Method

Participants

To conduct a comparison study of different English proficiency groups, sampling was conducted with 82 university participants who registered on the compulsory Freshman English course. A

simulated General English Proficiency Test (GEPT) at Intermediate level was used to assess students' reading and listening proficiency at the beginning of the study. The GEPT is a five-level criterion-referenced EFL testing system administered in Taiwan to measure the general English proficiency of EFL learners (Wu, 2008, p. 45). The GEPT-Intermediate level refers to the ability to use basic English to conduct daily life communication and is roughly equivalent to the ability of a high school graduate in Taiwan (LTTC, 2007, cited from Wu, 2008). Based on the results of GEPT test, three English proficiency groups were set up: (1) 44 RHLH participants with high reading and high listening English proficiency, (2) 20 RHLL participants with high reading and low listening English proficiency, and (3) 18 RLLH participants with low reading and high listening English proficiency. These participants' primary language spoken at school was Mandarin.

Instruments

Vocabulary pre- and post- tests

The pre- and post-tests were group tests featuring the same text, which measured the participant's ability to recognize English words. The pre-test contained 15 multiple-choice items measuring recognition of 15 words. The 15 target words were selected from the words used in five vocabulary followed-up tests. The maximum score for the pre-test and post-test was 15 respectively, with each correct response worth one point.

Vocabulary follow-up tests

Vocabulary follow-up tests were in cloze format. The twelve blank-filling questions were designed according to the content of the assigned video segment. Each blank was filled with one word. The total score of each test was 12 points, with one correct response worth one point. The possible maximum score of five tests was 60, containing 60 words.

One-on-one interviews

The interview was to explore how the participant successfully acquired vocabulary. Twelve participants took turns attending the one-on-one interviews. All interviews took place within a two-week period. Participants were selected who achieved the highest and the lowest total scores in vocabulary follow-up tests respectively from three proficiency groups. In total nine participants (five males and four females) joined the interview.

Video clips

This study used five English video-based lessons selected from the 2006 CNN news archive. These lessons are an online language learning program of the magazine, *Live ABC* Interactive Corporation (2007) issued in Taiwan. The lesson selection is based on the following criteria. They are similar in the length and topic interests. The length of the films is around 3 to 4 minutes.

Data Collection Procedure

There were eight periods for data collection with a period of fifty minutes per week. In the beginning of the study, all participants took the GEPT-Intermediate simulated test and were then divided into three English proficiency groups according to the GEPT test results. In the second period, participants responded to a vocabulary pre-test. From the third to the seventh period, the researcher assigned thirty minutes for participants freely to access the Internet to study the video lesson. Participants viewed one lesson in one class meeting. The participants in each group were tested for vocabulary acquisition immediately after viewing one video lesson. This study applied five video lessons and thus administered five vocabulary follow-up tests. In the last period, all participants completed a vocabulary post-test. One month after the VBCALL, one-on-one interviews were conducted with the participants selected from each proficiency group.

Results and Discussion

Paired t-tests and one-way ANOVA tests were performed on the dependent variables: the mean scores of pre-and post-tests and vocabulary follow-up tests. Numerous main effects and interactions were calculated. All interviews were recorded and fully transcribed. The interview data were analyzed qualitatively. Descriptive results of the three English proficiency groups' scores of vocabulary tests were summarized in Tables 1 and 2.

Vocabulary Incidental Acquisition in Vocabulary Pre- and Post-tests

The data in Table 1 demonstrates that mean scores of RHLH, RHLL, and RLLH groups' vocabulary post-tests are both higher than those of their pre-tests. The increased percentage score ranged from 1.12% (RLLH) to 3.4% (RHLH). The result reveals positive effects of the VBCALL program for different proficiency groups' incidental vocabulary learning. The findings that the students of the present study gained higher scores in the vocabulary post-test supported the conclusion from previous research that text along with video may help the learner to remember the words well (Hu, & Deng, 2007; Jones, 2004). This result is also consistent with that of earlier multimedia research which concluded that integrating text and video can enhance learners to visualize the meanings of words in a way that fosters meaningful learning outcomes (Akbulut, 2007; Kim & Gilman, 2008). The present study provided further evidence for Smidt and Hegelheimer's (2004) perspective that incidental vocabulary acquisition occurs through involvement in the CALL activity.

The paired sample *t*-tests show two statistically significant differences between the pre- and post-tests respectively (RHLH Group, $t = 3.4$, $p < .01$; RHLL Group, $t = 2.43$, $p < .05$). RHLL and RHLL groups respectively showed significant improvement in the vocabulary posttest. There is no significant difference between RLLH group's mean scores of pre-test and its post-test. RLLH Group did not make significant progress as those of RHLL and RHLH groups. Taken together, these pre- and post-test comparison results demonstrate that the video-based CALL activity actually fosters vocabulary acquisition across three proficiency groups. The findings of the current study suggest that the participants proficient in reading make significant progress in incidental vocabulary acquisition through completion of the video-based CALL activity.

Table 1 Paired *t*-tests of significance for three proficiency groups based on vocabulary pre-and

post-test means

Group	n	Pre-Test		Post-Test		Post/Pre <i>t</i>	<i>p</i> .
		Mean	SD	Mean	SD		
RHLH	44	60.88	10.15	67.30	9.98	3.40	0.00**
RHLL	20	57.64	10.00	64.68	8.30	2.43	0.02*
RLLH	18	54.62	8.51	56.88	7.93	1.12	0.27

Note. 1. * $p < .05$. ** $p < .01$. 2. Mean score represents correct percentage score.

Vocabulary Incidental Acquisition in Vocabulary Follow-up Tests

The results of follow-up vocabulary tests can further explain the effects of this activity. Descriptive statistics for the five vocabulary tests by three English proficiency groups in Table 2 show that RHLH Group (48.57) outperformed the other English proficiency groups in general vocabulary tests. The other two groups' total scores for the entire vocabulary were as follows: RHLL Group (43.35), and RLLH Group (39.05). Regarding 60 words throughout the five tests, RHLH Group scored the highest and achieved 81% correctness, whereas RLLH Group scored the lowest and achieved 65% correctness. Table 2 also reveals that the scores of the three proficiency groups from the first to the fifth test are presented in ascending order. For each group, their scores at the fifth test were respectively higher than those of their first tests. These results further demonstrate that the video-based CALL program can foster the three groups' vocabulary acquisition incidentally.

Table 2 Correct response in five vocabulary follow-up tests by three proficiency groups

Vocabulary Test	RHLH	RHLL	RLLH
VT1	7.20	6.55	5.50
VT2	9.89	8.45	7.17
VT 3	10.07	8.75	7.94
VT 4	10.75	9.4	8.94
VT 5	10.66	10.2	9.50
Total	48.57	43.35	39.05

Note. 1. VT 1, VT 2, VT 3, VT 4, and VT 5 represent the vocabulary tests for Videos 1, 2, 3, 4, and 5, respectively.

In addition, the results of one-way ANOVA in Table 3 show that in the five vocabulary tests, the total scores revealed significant differences between RHLH Group and RLLH Group ($p < .05$). That is, the score of RHLH Group is significantly higher than that of RLLH Group. This indicates that participants who are proficient in reading and listening may acquire more vocabulary than those who only have good listening skills. The results in Table 3 showing no significant difference between RHLH Group and RHLL Group further suggest that participants who are proficient only in reading receive scores quite similar to those of participants who are proficient in both reading and listening. The data in Table 3 reveal that there was no significant difference between RHLL and RLLH Groups. However, the data in Table 2 show that RHLL Group's total score (43.35) is higher than that of RLLH Group (39.05), although comparisons between RHLL and RLLH Groups show no statistical significance in Table 3.

Table 3 ANOVA comparisons for the three proficiency groups' vocabulary acquisition

		Mean Difference		
(I) Group	(J) Group	(I-J)	SD	<i>p</i>
RHLH	RLLH	9.51(*)	2.59	.00*
	RHLL	5.22	2.50	.23
RHLL	RLLH	4.29	3.01	.56
	RHLH	-5.22	2.50	.23
RLLH	RHLL	-4.29	3.01	.56
	RHLH	-9.51(*)	2.59	.00*

Note. * $p < .05$.

Interview Interpretation of Vocabulary Acquisition

Table 4 shows that the highest scores ranged from 53 to 60; four participants received the maximum scores of 60. The lowest scores ranged from 23 to 32. Additionally, all four participants receiving the lowest scores were males. In the interviews, the participants with the highest scores (hereafter successful participants) from RHLH, RHLL, and RLLH Groups were able and willing to report a greater amount of content than their counterparts who received the lowest scores (hereafter unsuccessful participants). The interpretation was presented in terms of the participants' affective response and after-class practice effect.

Table 4 The information for the participants joining the interview

Score variable	Group	Participant	Gender	After-class practice (hour/week)	Total score
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Highest	RHLH	Jane	F	2	60
		Helen	F	2.5	60
		John	M	1.5	60
Lowest	RHLL	Mary	F	4	60
	RLLL	Lisa	F	1.5	53
	RHLH	Tom	M	1	32
		Jack	M	0	32
	RHLL	Robert	M	2	23
RLLH	Kevin	M	0	28	

The interview reports demonstrate affective effects on both successful and unsuccessful participants. All of them had great interest in such video-based lessons. Furthermore, successful participants confirmed that video actually fostered their imagination of English text and also assisted their memory significantly. For example, the participant (Jane) noted: “I could understand the content better when I see people’s facial expressions and body gestures.” The participant (John) elaborated on this by stating that when he selected words to fill in the blank in the test, he read through the sentence and a visual image from the video lesson flashed through his mind. The participant (Mary) mentioned that she remembered images better than words, and liked to view video and listen to annotation simultaneously. Another successful participant (Helen) mentioned that she liked video-based lessons and replayed the lesson to practice the vocabulary. She also said that she learned words from written subtitles and translation, oral annotation, and video images.

In addition, the interviews reveal after-class practice effects on these participants. I asked them whether they continued to use this program to practice English after class, and how many hours in a week they spent learning English through this program. All successful participants replied that they continued to use this CALL program to practice English listening after class and also tried to memorize some words. For unsuccessful participants, the situation was different. Two out of four participants said that during the period of the study they did not use this program after class.

Some unsuccessful participants’ extracts may further offer insights into the effect of the program. First, incidental learning of words likely occurred when unsuccessful participants were provided with access to written translations on screen. The participant (Robert) said that he read the Chinese translation when he listened to oral annotation. However, he could not recall anything from the video lesson when taking the vocabulary test, and he just filled in the blanks

by reading the sentences in the test. Second, video-based lessons may have provided too much information. The participant (Tom) felt exhausted when he read Chinese and English subtitles at the bottom and watched video at the top of the screen; furthermore, he mentioned that it was hard to connect words and images. Third, video viewing is for learning, not for testing. The participant (Jack) enjoyed viewing videos, but he said that watching the video lesson was one thing; to take the test was another. He thought that it was necessary to master a testing skill to achieve high scores in a test. Another participant (Kevin) expressed the same opinion that he focused on listening to the conversation and viewing the video to catch the overall gist of the clip. He explained that he did not pay attention to the words so he was not able to recognize vocabulary well in the test.

In general, participants proficient in only one area could not acquire significantly more vocabulary than those proficient in both reading and listening. The results show that English reading and listening proficiency plays a role in incidental acquisition of general vocabulary. RHLH participants scored significantly more points than RLLH participants in the recognition of total vocabulary. Furthermore, the results show that the difference between RHLH and RHLL participants in vocabulary tests was not significant. These findings suggest that participants proficient only in listening do not perform better than their counterparts proficient in reading, as reading skills are essential to video comprehension. This is likely due to the fact that most students did not have much experience using video clips to learn English before participating in this study. In class, the English textbooks lacked images; information was conveyed primarily through printed words. Therefore, students were trained primarily in reading. In this study, RHLL Group's English reading ability is statistically equivalent to that of RHLH Group. When viewing video clips, they relied heavily on reading the verbal messages. As a result, some participants highly proficient in reading (RHLL participants) likely achieved high scores and were not significantly different from RHLH participants. With the knowledge of the differences in vocabulary acquisition among different proficiency groups and how learners acquire and retain vocabulary successfully, instructors may take practical steps and design multimedia teaching activities to improve L2 learners' vocabulary.

Interview data show that successful participants were more likely to adjust themselves and spent more time in acquainting themselves with the new learning material. The adage of "practice makes perfect" appears to have been prevalent among such participants. Qualitative

data also account for positive effects of video on vocabulary learning. However, the interpretation of findings from a small number of participants cannot be generalized to the wider population. It is necessary to conduct further quantitative studies to examine the impact of video in more detail.

Conclusion

The question of what effect the video-based CALL program has on L2 learners' vocabulary learning was answered in this study. In summary, these findings suggest that first, the video-based CALL program facilitates vocabulary incidental acquisition of students with different English proficiency abilities. Second, when viewing the video-based CALL program, students with proficient English reading and listening skills outperform those who are not proficient in the two skills in vocabulary learning. Moreover, if students are proficient in only one of these skills, reading skills contribute more to their vocabulary acquisition than listening skills. In general, the findings exhibit the essential role of English reading and listening proficiency in incidental vocabulary acquisition by means of video-based multimedia material. Thus, it should be noted that the absence of proficient English reading or listening ability may lead to the failure of comprehending video-based lessons and even worse the washout of vocabulary acquisition.

Findings of the study suggest important pedagogical implications for the use of video in L2 vocabulary acquisition. In video-based CALL environments, learners should be trained with skilled reading and listening abilities. According to the results in this study, it may be assumed that as both reading and listening proficiency increases, the outcome of incidental vocabulary learning may increase. In a CALL environment, interaction between the learners and the text provides individualized learning and promotes learning autonomy. More specifically, learners can have control over their learning process and plan to learn at their own will and pace. Therefore, learners proficient in only one area can make use of such computerized environments to strengthen their deficient reading or listening skills efficiently because of the written and spoken text that video-based CALL programs provide. Another implication of the integration of news video in English instruction is that the presentation of authentic input is made more comprehensible with authentic images and settings of the world in the program. Learners are not only presented with real English, but also with original means to deal with the authentic language.

Finally, vocabulary learning is more than individual word learning. By learning words in context, the learner acquires not only linguistic knowledge of a word, such as phonetic, syntactic and semantic rules, but also the knowledge of how to use the word properly in a context. To foster meaningful L2 vocabulary learning, multimedia presentation should present video that effectively integrates visual and auditory messages. This study provides a practical CALL program designed to meet the students' language learning needs in class or out of the class, and to achieve the goal of multimedia language education – learning in a concrete and meaningful context, with confidence, and for comprehension.

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References

- Akbulut, Y. (2007). Effects of multimedia annotations on incidental vocabulary and reading comprehension of advanced learners of English as a foreign language, *Instructional Science*, 35, 499-517.
- Çakir, I. (2006). The use of video as an audio-visual material in foreign language teaching classroom. *The Turkish online Journal of Educational Technology*, 5(4), 67-72.
- Candlin, C. N., & Hall, D. R. (2005). *Computer-assisted Language Learning*. Essex: Pearson Educational Limited.
- Canning-Wilson, C., & Wallace, J. (2000). Practical aspects of using video in the foreign language classroom. *The Internet TESL Journal*, 1(11). Retrieved Oct. 25, 2008 from: <http://itesl.org/Articles/Canning-Video.2001.html>
- Caspi, A., Gorsky, P., & Privman, M. (2005). Viewing comprehension: Students' learning preferences and strategies when studying from video, *Instructional Science*, 33, 31-47.
- Erben, T., Ban, R., & Castañeda, M. (2009). *Teaching English language learners through technology*. New York: Routledge.
- Fisch, S. M. (2000). A capacity model of children's comprehension of educational content on television. *Media Psychology*, 2(1), 63-91.
- Hemei, J. (1997). Teaching with video in an English class. *Journal of English Teaching Forum*,

35(2), 45-47.

- Hu, H. P., & Deng, L. J. (2007). Vocabulary acquisition in multimedia environment. *US-China Foreign Language*, 5(8), 55-59.
- Hubbard, P. (2009). A general introduction to computer-assisted language learning. In P. Hubbard (Eds.), *Computer Assisted Language Learning: Critical Concept in Linguistics* (Vol. 1, pp. 1-20). New York: Routledge.
- Jones, L. (2004). Testing L2 vocabulary recognition and recall using pictorial and written test items. *Language Learning and Technology*, 8(3), 122-143.
- Kim, D., & Gilman, D. A. (2008). Effects of text, audio, and graphic aids in multimedia instruction for vocabulary learning. *Educational Technology & Society*, 11(3), 114-126.
- Language Testing and Training Center [LTTTC]. (2007). General English Proficiency Test. [Brochure]. Retrieved November 17, 2007, from: <http://www.lttc.ntu.edu.tw/acdemics/testmain.htm>
- Laufer, B. (1997). What's in a word that makes it hard or easy: Some intralexical factors that affect the learning of words. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 140-180). Cambridge: Cambridge University Press.
- LiveABC Interactive Corporation (2007). Text and video learning interfaces retrieved July 24, 2009, from: <http://www.liveabc.com/english/cdrom.asp>
- Mayer, R. E. (2002). Multimedia learning. In B. H. Ross (Ed.), *The Psychology of learning and motivation* (Vol. 41, pp. 85-139). San Diego, CA: Academic Press.
- Mayer, R. E. (2005). Cognitive theory of multimedia learning. In R. E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 31-48). Cambridge: Cambridge University Press.
- Mayer, R. E., & Anderson, R. B. (1992). The instructive animation: Helping students build connections between words and pictures in multimedia learning. *Journal of Educational Psychology*, 84(4), 444-452.
- Mayer, R. E., & Gallini, J. K. (1990). When is an illustration worth ten thousand words? *Journal of Educational Psychology*, 82(4), 715-726.
- Mayer, R. E. & Moreno, R. (1998). A split-attention effect in multimedia learning: Evidence for dual processing systems in working memory. *Journal of Educational Psychology*, 90(2),

312-320.

- Moreno, R., & Mayer, R. E. (1999). Cognitive principles of multimedia learning: The role of modality and contiguity. *Journal of Educational Psychology, 91*(2), 358-368.
- Nassaji, H. (2003). Higher-level and lower-level text processing skills in advanced ESL reading comprehension. *Modern Language Journal, 87*, 261-276.
- Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.
- Read, J. (2000). *Assessing vocabulary*. Cambridge, UK: Cambridge University Press.
- Rhodes, N., & Puhfahl, I. (2003). Teaching foreign languages to children through videos. ERIC Digest, EDO-FL-03-10. Washington DC: ERIC Clearinghouse on languages and linguistics.
- Smidt, E., & Hegelheimer, V. (2004). Effects of online academic lectures on ESL listening comprehension, incidental vocabulary acquisition, and strategy use. *Computer Assisted Language Learning, 17*(5), 517-556.
- Tomlinson, B. (Ed.). (1998). *Materials development in language teaching*. Cambridge: Cambridge University Press.
- Warschauer, M. (1996). Computer-assisted language learning: An introduction. In Fotos S. (Ed.), *Multimedia language teaching* (pp. 3-20). Tokyo: Logos International.
- Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language Teaching, 31*, 57-71.
- Wu, J. (2008). An Investigation of the relationships between strategy use and GEPT test performance. *English Teaching and Learning, 32*(3), 35-69.