UNIVERSIDAD JESUITA DE GUADALAJARA
ITESO
Sinéctica
revista electrónica de educación

Multimedia Instruction on Latin Roots of the English Language and L2 Vocabulary Learning in Higher Education Contexts: Learner Proficiency Effects[1*]

Veronika de la Cruz Villegas & Jesús Izquierdo*

Resume: master in Teaching. Professor and researcher at Universidad Juárez Autónoma. She investigates issues related to second language vocabulary acquisition, computer-assisted language learning, and educative inclusion in higher education.

***Resume:** PhD in Second Language Education (McGill University, Canada). Professor and researcher at Universidad Juárez Autónoma. He investigates issues related to second language vocabulary acquisition, computer-assisted language learning, and second language teacher education.

Submitted: September 9, 2013. Accepted for publication: January 27, 2014.
How to reference this article: http://www.sinectica.iteso.mx/articulo/?id=42_multimedia_instruction_on_latin_roots_of_the_english_language_and_l2_vocabulary_learning_in_higher_education_contexts_learner_proficiency_effects

Resumen

Este estudio examinó el impacto de una aplicación multimedia basada en las raíces latinas de la lengua inglesa en el aprendizaje de vocabulario entre estudiantes universitarios. Se exploraron los efectos de dos niveles de competencia de la lengua inglesa: principiantes (*n=7*) y falso-principiantes (*n=8*) en el aprendizaje de vocabulario. Los estudiantes trabajaron dos sesiones con una aplicación multimedia. El análisis no paramétrico reveló ganancias significativas en el vocabulario incluido en la aplicación, independientemente del nivel de competencia del inglés de los alumnos. Sin embargo, éstos no pudieron transferir ese conocimiento a nuevo vocabulario. Los resultados sugieren que los participantes obtuvieron beneficios parciales de la aplicación, ya que sólo les permitió memorizar el vocabulario presentado.

Palabras clave: tecnología educativa, multimedia, aprendizaje de lenguas

Introduction

Various studies have examined the process of second language (L2) learning through instruction with and without computer assistance as well as the effectiveness of these two L2 learning instruction types (Chapelle, 2001, 2003). With respect to the former, researchers have explored the benefits of using a variety of computerized tools, such as computer-meditated communication, concordancing, and multimedia, to mention a few. This paper explores the use of multimedia applications to foster L2 vocabulary learning.

Multimedia can be defined as the simultaneous use of texts, sounds and moving

[1] * This study was funded through a research grant awarded to the second author by the Universidad Juárez Autónoma de Tabasco through the Institutional Research Development Program (UJAT-2008-C04-02). Preliminary results of this study were presented at the 2010 Congress of the Canadian Association of Applied Linguistics, Montreal, Canada. We are grateful to the participating teacher and students and our research assistants for contributions to various phases of this research. We gratefully acknowledge the anonymous journal reviewers for their helpful comments on earlier versions of this article.

images (Mayer, 2005). In L2 education, the definition of multimedia put forward by Mayer (2005) has been interpreted as the use of words and pictures to facilitate the meaning-oriented use of the target language through input and output-based opportunities (Izquierdo, in press; Plass & Jones, 2005). In a recent review of the multimedia literature, Izquierdo (in press) summarized the manner in which language learners seem to benefit from multimedia instruction through input and output-based multimedia applications and the effectiveness of multimedia features to facilitate students' learning of L2 vocabulary and grammar. In his literature review, however, Izquierdo emphasized the importance of exploring the role of the L2 proficiency of the learners when they use multimedia applications for L2 learning as the success of learning tasks may be in line with the L2 competency of the learners.

In line with Izquierdo's (in press) argument, Yoshii and Flaitz (2002) examined the interaction between three different multimedia environments, L2 vocabulary comprehension and retention, and L2 proficiency. The researchers exposed 151 English as a Second Language learners from two levels of proficiency to multimedia-based reading comprehension environments. In these environments, vocabulary support was provided (i) with pictures, (ii) with text, or (iii) with text and pictures. A vocabulary pre-test showed that learners from both proficiency groups were not familiar with the words targeted in the experiment. Results from analyses of variance revealed that participants exposed to the combined use of text and pictures had retained more vocabulary from the reading text than their counterparts in the other two multimedia conditions at post-test and delayed post-test times. Further, the analyses showed that multimedia equally benefited learners from both proficiency levels, leading to no gain differences between proficiency groups.

Based on the results of a later study, Yoshii (2006) suggested, however, that further research was needed to examine the effect of multimedia on L2 vocabulary learning considering the learners' L2 proficiency level. Yoshii hypothesized that more proficient L2 learners would benefit more from multimedia instruction on L2 vocabulary that would include no reference to the first language (L1) of the learners than lower level learners. Lower level learners, however, would benefit more from L2 multimedia instruction that would include reference to the learners' L1. Kawauchi (2008) also emphasized that one of the serious problems that English college teachers face in Japan is the diversity of the L2 proficiency of their students. The researcher indicated, however, that computer-based vocabulary learning could be one way to help learners develop English vocabulary irrespective of their L2 proficiency level. While the results of Kawauchi's research (2008) supported the beneficial effects of computer instruction for vocabulary learning, the study revealed that computer-based vocabulary learning was more effective among the students of the lower level than among those of the upper level (for similar results in regard to L2 grammar development, see Izquierdo, in press). While differential results obtained in terms of vocabulary gains among the L2 proficiency groups, their perceptions were quite positive and similar with respect to the use of computers to learn vocabulary.

The confounding results obtained in the previous studies, then, make it difficult to outline the potential effects of multimedia instruction on L2 vocabulary learning when learners from different L2 proficiency levels are exposed to the type of environments implemented in the previous studies. In these studies, all learners were exposed to multimedia environments where learning would occur implicitly

from reading or listening tasks. In other words, in these environments, learners were expected to unconsciously take in the target words, while they completed the comprehension-based tasks, where no explicit teaching was conducted. In her review of the L2 research on vocabulary acquisition, DeCarrico (2001) indicated that vocabulary learning occurs with less difficulty through implicit rather than explicit instruction once learners have built up a lexicon of 2000 words, because learners have already developed a lexical threshold that allows them to continue building their vocabulary through implicit tasks.

Multimedia Applications on L2 Vocabulary Learning

Several studies have examined the effects of multimedia applications on L2 vocabulary learning through implicit instruction (e.g., Lyman-Hager & Davis, 1996; Chun & Plass, 1996; Wood, 2001; Nikolova, 2002; Yanguas, 2009). However, to our knowledge, only Groot's (2000) study provided a first indication that multimedia applications including explicit instruction, operationalized through intensive processing of new words rather than through unsystematic processing of the words out of context, could lead to better long-term retention. Moreover, based on the information-processing model of L2 learning (See DeKeyser, 2007; Lyster, 2004), which describes L2 learning as the acquisition of complex cognitive skills through the proceduralization of declarative knowledge; the process of L2 vocabulary learning can be enhanced. Lyster (2004) discusses that, in language learning, declarative knowledge relates to the knowledge of language items learners hold. The proceduralization of this knowledge refers to the cognitive operations that students develop to produce language spontaneously by effortlessly retrieving information stored in memory.

In the current multimedia literature, it then remains to be explored whether the L2 level of less proficient learners could mediate lexical gains when they are exposed to multimedia environments that include explicit instruction on the type of vocabulary they are expected to learn. To address this issue, in the current study the following research question was asked: Do differential vocabulary gains result among learners from two proficiency levels of English under a 1000 word threshold when learners are exposed to a multimedia environment that includes explicit instruction on Latin roots of English words?

Method

To answer the research question of the study, a classroom-based quasi-experimental study with one independent and one dependent variable was conducted. The independent variable was the English proficiency level of learners (true beginners and false beginners) and the dependent variable was English vocabulary gains. Based on the assumption that explicit L2 vocabulary instruction may be more beneficial among the learners under a 2000 word threshold, the following hypothesis was formulated: Differences in L2 proficiency level of the ESL young-adult learners under a 1000 word threshold will lead to no differential vocabulary learning gains among students exposed to multimedia environments with explicit instruction on the Latin roots of English words.

The following quantitative instruments were used to test our hypothesis: A vocabulary proficiency test, and a homemade vocabulary test.

Participants

One intact class with 50 students from one section of the Etymology course of the BA in Language Studies of a Mexican university participated in the study. However, learners' incompletion of some of the activities in the experiment reduced the final population number to 15. The course focused on the evolution of the English language. In the last unit of the course, students needed to learn about Greek and Latin roots of the English language. Based on the results of a lexical proficiency test, learners from this course were classified as group A and B. Group "A" included the true beginners and Group "B" included the false beginners who worked with the multimedia instruction. The proficiency grouping procedures are explained in a later section. In Group "A," there were seven students: one male and six female participants. In Group "B," the population was eight: two men and six women.

Learners' answers in the socio-demographic questionnaire indicated that 26% of the learners felt they had a basic knowledge of English; 25% had a basic knowledge of French or Italian; and 49% felt they only knew Spanish; 49% of the participants said that learning new vocabulary was not difficult, while 51% indicated having some difficulties remembering new vocabulary; 55% reported using strategies such as word repetition, listening to music, films, reading, translations, and flash cards to learn new vocabulary, and 80% indicated no previous use of software to learn vocabulary.

Multimedia Application

Instructional Design. To conduct the study, a homemade multimedia instruction was designed after the information-processing model (DeKeyser, 2007). The application was called Ethoks and its design was aimed to take the learners systematically through the sequence of mental operations that could lead them to the automatization of new vocabulary. This application adapted the stages used by Groot in his (2000) computerized vocabulary teaching study to the information-processing model as discussed by DeKeyser (2007) (See Table 1). Groot (2000) pointed out that, during new vocabulary learning, the different stages of the cognitive position cannot always be clearly distinguished, because learning a word is an incremental process that gradually develops with repeated exposure. Further, he indicated that there is a constant interaction between the various stages. However, based on the information-processing model, as explained by DeKeyser (2007), vocabulary learning through multimedia applications can be operationalized through the following stages: declarative proceduralization and automatization knowledge.

Table 1. Comparative table for Groot's (2000) and DeKeyser's (2007) models

Groot's Levels of Processing	DeKeyser's Information-Processing Model
Noticing	Declarative Knowledge
Storage	Practice Procedural Knowledge
Consolidation	Automatization

In Ethoks, the first stage of the information-processing model was operationalized through the presentation of the Latin roots of English and the different functions that the root can play in a word, for instance, prefix, suffix, or the word base. Then, in the second stage, students were provided with different examples and tasks

showing the use of the root in different words and the way these new words interact with other words to build up a particular meaning. Finally, in the third stage, students did different exercises (e.g., multiple choice, fill in the blank) to retrieve their newly learned vocabulary information through practice, as Figure 1 illustrates.

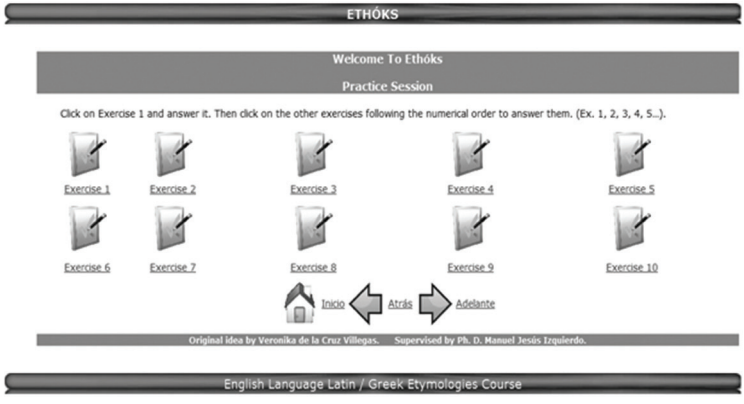

Figure 1. Software screen with links to the various types of practice exercises

Target Vocabulary. Words are made up of prefixes, roots, and/or suffixes. Various authors have recommended teaching students the parts of speech and how to "dissect" words by using Latin/Greek roots (Callella, 2004). Further, to highlight the importance of the study of Latin and Greek roots, Green (2008) pointed out that more than 60% of English words have Greek or Latin roots. Moreover, in the lexicon of science and technology, the figures rise to 90%. Thus, Green indicated that, through the Greek and Latin roots of English, learners cannot only expand their vocabulary, but they can also know about the history of the English language. The multimedia application presented learners with information on five Latin roots PED (POD), MAN, SECT, DICT and PORT. PED is a Latin root, also known as POD in Greek, as in the word "pedestrian". The English meaning of these roots is "foot". With respect to the other roots, they are all of Latin origin. The root MAN, as in the word "manual", means "hand", SECT, as in dissect, means "to cut", DICT stands for "to speak", as in "dictation", and PORT, as in "transport", means "to carry". The roots were selected randomly from the course book *Greek and Latin roots* (Callella, 2004). The words selected for the multimedia application represent a subset of those that are highlighted by the publisher.

Lesson Organization. Ethoks was organized in two lessons of two hours each conducted in two different days. Lesson 1 was for the presentation of the multimedia application, its description and a short overview of the five vocabulary sessions included in Lesson 2. Each vocabulary session contained 10 words derived from the Latin roots previously presented. Each vocabulary session took about 15 minutes to complete. The sessions consisted of three sequential stages, following the information-processing model. The first stage presented the Latin root and its meaning in Spanish and English, the pronunciation of the word and the syntactic property. The second stage aimed at helping students to store the new informa-

tion in the lexicon through various tasks. In the last stage, learners were presented with different kinds of activities which elicited the various properties of the words.

Lesson 2 also took learners through three stages, following the conceptual design of the application. First, a review of the roots presented in Lesson 1 was provided. Then, learners practiced, and finally, the application presented links exposing learners to other activities that would allow them to retrieve their knowledge of the Latin roots of English words. A self-evaluation was applied at the end.

Proficiency Grouping Test

To identify the amount of vocabulary that students had prior to the study, a vocabulary proficiency test was used. This test consisted of a printout of the online test called 1k, version 1 (Nation, 2001). The test is available at http://www.lextutor.ca/tests/, and consists of 39 sentences that learners need to identify as true (T) or not true (NT) in accordance with an image. The sentences were short and contained words classified within the most frequent 1000 words of the English language. The test required participants to determine whether the word presented in the sentence corresponded to the accompanying picture (the test is available through the Compleat Lexical Tutor at http://www.lextutor.ca/tests/levels/recognition/1k/test_1.html). Learners' answers in this test were marked to identify the number of correct, incorrect and unknown responses. For instance, participants were given the option X which means "I do not understand the question". Then, a raw score for proficiency was established based on the number of correct answers.

Vocabulary Test

The test aimed at determining how much vocabulary, including the target roots, the learners knew before and after the use of the multimedia application. There were two versions of this test. The vocabulary test was homemade and consisted of 70 testing items. It was designed following the outline of the 1k vocabulary test from Lextutor, previously described. The test included 10 words for each of the Latin roots, adding up to 50 target words randomly chosen from the book Latin and Greek roots (Callella, 2004) and 20 distractor words. From the 10 words selected for each target root, five were presented in the application and five were not. This word differentiation was necessary to determine whether learners were memorizing the English words from the Latin roots presented in the software, or whether they were learning the target roots and, thus, would then be able to draw on this knowledge to infer new words. Finally, the 20 distractor words were not related to the etymologies of the words included in the multimedia application. These words were taken from the Skyline (Brewster, 2011) student's book, which is the official book for English language students enrolled in the BA program.

L2 Vocabulary Proficiency Grouping Procedure

In the proficiency test, participants obtained a score ranging between 16 and 23 points. The proficiency group split was set at 19 to have balanced score ranges within each group (i.e., 4). Students in the true beginner group obtained a score between 16 and 19, whereas students in the false beginner group obtained a score between 20 and 23. This score split led to two proficiency conditions: True Beginners (n = 7) and False Beginners (n = 8). The statistical validation of the group organization is discussed in a later section.

Experiment Development

The experiment took place in fall 2009 during regular class periods. One week prior to the study, the students completed the proficiency and vocabulary tests on the target words. The following week, the students worked with Ethoks during in-class time at the computer center in two sessions of two hours each. After each session they answered the student attitude questionnaire. Upon the completion of the second lesson, students were administered the vocabulary test on the target words and were acknowledged for their participation in the study.

Data Analysis

To examine the influence of the English proficiency level on L2 vocabulary learning, non-parametric analyses were conducted on the results from the proficiency and the vocabulary test. This type of statistical analysis was selected due to the small number of participants in each of the experimental groups. To examine differences between groups, the Mann-Whitney analysis for non-related groups was used, as the data came from two different populations during the same testing time. To examine differences within groups, the Wilcoxon analyses for related groups were used, as the data came from the same population but at different testing times. Group differences were significant when a p smaller than the alpha level of .05 was obtained. The effect size, r, was computed for pairwise comparisons by dividing the z-score test-statistic by the squared root of the total number of observations as suggested by Field (2005).

Results

Proficiency Test Results

As indicated previously, based on the results of the proficiency test, two proficiency level conditions were created: True Beginners (n = 7) and False Beginners (n = 8) who were exposed to English Latin etymologies through a multimedia application. To statistically validate the lexical proficiency difference of the participants, the Mann-Whitney analysis for non-related groups was used. These analyses yielded significant score differences between the scores of the true and false beginners displayed in Table 2, $U < .001$, z (-3.27), $p = .001$, $r = -.84$.

Table 2. Proficiency test results

Proficiency condition	*n*	*Mean*	*SD*	*Median*
False beginner	7	17.14	1.069	17.00
True beginner	8	21.38	1.302	22.00

Vocabulary Test Results

In Table 3, learners' behavior in regard to the Latin-root words included in the multimedia application can be observed; the Mann-Whitney analysis for non-related groups indicated that there was not a significant difference between true beginners and false beginners in the first testing time, $U = 20.500$, z(-.88), p=.376, $r = -.22$. Also, the difference between the true beginners and false beginners was not significant during the post test, $U = 21.500$, z(-.76), p=.446, r =-.19.

Table 3. Pre-test and post-test experimental groups' medians

Proficiency condition	*n*	Words included in the application		Words not included in the application	
		Pre-test	Post-test	Pre-test	Post-test
True beginners	7	6.93	7.07	7.86	8.00
False beginners	8	8.94	8.81	8.13	8.00
Global	15	15.40	17.53	12.47	14.07

In the case of the medians for words that were not included in the multimedia application (Table 3), the Mann-Whitney analyses indicated that there was not a significant difference between true beginners and false beginners in the first testing time, U= 27.000, z(-.11), p=.907, r= -.02. Neither was the difference between the true and false beginners significant during the post-test, U= 28.000, z(.000), p=1.000, r<-.01. These results indicate that there were no differences between the groups in terms of their knowledge of English words from Latin origins at both testing times.

About the pre- and post-test comparison results, the Related Non-parametric conducted on the global scores indicated that all participants improved their scores between the first and the second testing times in regard to the words included in the multimedia application, z(-3.47), p=.001, r= -.89. However, results indicated that participants did not improve between the first and second testing times in the words not included in the multimedia application, z(-1.82), p=.001, r= -.46.

With respect to the effects of L2 proficiency on score changes within groups between the testing times, the Wilcoxon analysis for related groups revealed a significant difference in the scores of the true beginners between the pre and the post vocabulary test for words included in the multimedia application, z(-2.37), p=.017, r= -.89. Similar results were obtained in the score difference of the false beginners between the pre and post vocabulary test for words included in the multimedia application, z(-2.63), p=.008, r= -.92. In the case of the words that were not included in the multimedia application, the analysis revealed that there was not a significant difference in the scores of the true beginners between the pre and post vocabulary test for words not included in the multimedia application, z(-1.49), p=.136, r= -.55. Likewise there was not a significant difference in the scores of the false beginners between the pre and post vocabulary test for words included in the multimedia application, z(-1.11), p=.263, r= -.39.

To sum up, the statistical results indicated that the proficiency level of learners did not lead to differential vocabulary learning gains. The students, from both proficiency groups, significantly improved their scores between testing times with respect to English words of Latin origin that were included in the software. Yet, no changes occurred with respect to English words of Latin origin that were not in the application.

Discussion

This experiment examined the impact of the ESL proficiency level of multimedia application users on L2 vocabulary achievements. The research question asked whether the effects of the multimedia instruction would be mediated by the L2 proficiency of the students. It was hypothesized that differences in L2 proficiency levels of the ESL young-adult learners under a 1000 word threshold would lead to no differential vocabulary learning gains among students exposed to multimedia

environments with explicit instruction on the Latin roots of English words. This hypothesis was retained, as the statistical analyses revealed that there were no differences between the scores of true beginners and false beginners in the pre and post-tests in the case of the words that were included in the multimedia application. This absence of significant differences between groups indicates that the proficiency level of learners did not have an impact on the vocabulary gains obtained after the use of the multimedia application. Further, the statistical analyses revealed that both proficiency groups' score changes from pre and post-test happened with respect to words included in the software only.

Researchers have suggested that the proficiency level is a variable that should be investigated in studies related to language learning (Izquierdo, in press; Yanguas, 2009). Moreover, in light of the confounding results with respect to interplay between vocabulary learning during multimedia instruction and L2 vocabulary growth (Groot, 2000, Al-Seghayer, 2001, Cziko & Park, 2003, Huang & Liou, 2007), this study explored L2 vocabulary learning gains among learners whose lexical threshold can be considered within two beginner levels, true and false. Our results showed, that below a 1k lexical threshold, the two proficiency levels of learners, true-beginners and false beginners, significantly improved their Latin-root English vocabulary from the pre to the post-test in the words included in the multimedia application.

This is congruent with previous research findings in L2 multimedia research (See Izquierdo, in press). These results complement studies indicating that, when low-proficiency students are exposed L2 vocabulary instruction, proficiency differences at this level is not an impediment for lexical development. However, the absence of significant score gains with respect to the English words of Latin origin that were not included in the multimedia application suggest that participants were not able to transfer the knowledge they had from the multimedia application, which suggests item rather than system learning (see Ellis, 1999). It remains to be explored whether more proficient learners of English, those above the 1000 word threshold, would be able to better benefit from instruction since they would have a richer lexical soil. However, in the case of the observed learners, there were factors around the experiment that might have led to the documented results. Some of the factors were the amount of time for the completion of the activities, the non-familiarity of the learners with the multimedia application, learners lack of attention to the instructions and the language used in the multimedia application.

In terms of time allocation for the completion of the tasks, during the experiment, Ethoks presented students with various practice tasks. However, the time students had to go through the activities was not enough to complete all the tasks. As discussed earlier, the application tasks were built upon a potential operationalization of the information-processing model. This conceptual model requires learners to move from declarative knowledge to the automatization of the word knowledge, where the retrieval of word information from the mental lexicon for productive use requires faster accessibility and less effort (Groot, 2000). It was observed, during the implementation of Ethoks, that the students did not have sufficient time to develop mastery of their Latin root knowledge vocabulary. This drawback in the software design seems to have led to the memorization of the vocabulary and examples presented during the declarative stage. Moreover, retrieval of information around the Latin roots of a word from the mental lexicon for productive use requires a more solid integration of various cognitive processes. Thus, to use Ethoks, learners requi-

red more time and practice to develop the procedural mental representations and retrieval mechanisms that would foster automatization.

Another factor influencing the effects of the proficiency level of the multimedia application users might have been the non-familiarity of the students with Ethoks. In the study, there were three instructional stages that aimed at triggering the cognitive processes necessary to automatize declarative knowledge. In the questionnaire data, some students indicated that the software and its functionality were new to them, and that they did not have time to recognize and get familiar with the Ethoks structure. This absence of familiarity with the instructional tool could have further prevented the learners from moving to the latest stage of the information-processing model: automatization.

Conclusion

Although there have been previous studies examining the effects of the ESL proficiency level of multimedia application users on different aspects of L2 learning (Lyman-Hager & Davis, 1996; Chun & Plass, 1996; Groot, 2000), this is the first study emphasizing the importance of the study of Latin roots as a strategy to learn vocabulary. In this study, it was observed that learners showed significant score gains in the words included in the multimedia application, but that they were not able to transfer these gains to the words not included in the application. In other words, learners were not able to move from item to system learning. Moreover, the absence of significant differences between the proficiency conditions might have been related to factors affecting the learning process, such as the time for the completion of the activities, the non-familiarity with the multimedia application, learners' lack of attention to the instructions, the language used in the multimedia application, the similarity between the mother tongue of the participants and the L2, the absence of opportunities for the proceduralization of knowledge.

The results from the study make valuable contributions at the theoretical, pedagogical and institutional levels. At the theoretical level, the use of etymologies to teach and learn L2 vocabulary is an important contribution of this study. Learners exposed to multimedia instruction built upon the information-processing model encounter, through the learning of etymologies, an alternative mode to learning vocabulary outside of the regular classroom instruction. In previous studies, researchers showed that multimedia applications promote autonomous learning (Chapelle & Jamieson, 2008). While the quantitative results of our study do not provide direct support to such a claim, the individual use of the multimedia application might have lowered students' awareness of teacher-centered feelings in the classroom, (see also Chun & Plass, 1996; Groot, 2000; Laufer & Hill, 2000).

While the information-processing model did not find a good platform in this study to show its effectiveness, the contributions of the study to this cognitive approach to language learning were various. It was observed that the absence of operationalization of the steps of the cognitive process could prevent learners from effective learning. As was seen in this study, the automatization stage was not reached which made it impossible for learners to transfer their knowledge of the Latin roots from the software to other words of the English language. Further, the information-processing model describes skill acquisition as a gradual change in knowledge through which learners are taken systematically through a process of deduction and practice to eventually come to a process of automatization of the knowledge.

This process requires time and extended practice to arrive at the actual contributions of the model. Its real effects could best be observed when a logical period of time to cover each step would be assigned and when learners' intense exposure to Latin roots of English words would be provided. While Ethoks developed the first stage of the information-processing model, as the multimedia application exposed learners to the etymological information of words, the second and the third stages (i.e., proceduralization and automatization) were not triggered through Ethoks. Yet, these stages can be fostered through teacher-fronted tasks. This combination of technology plus teacher-fronted instruction could lead to blended learning which might be a well-received instructional approach for L2 learners.

At the pedagogical level, current teaching practices could be enhanced through the multimedia application called Ethoks, which provides learners with information about the part of the speech that a word plays in a sentence (noun, verb, adjective, or adverb); this aspect can also be beneficial in syntax classes. In Ethoks, learners find audio-files containing the pronunciation of all the words included in the multimedia application, thus, it could be used to teach pronunciation. Ethoks is designed to be used as part of a process of teaching or learning, enriching it with extended practice and through the exposure of the learner to real situations in which to use the new vocabulary in real contexts. Thus, this multimedia application can be useful for teachers interested in providing learners with intense and continuous vocabulary practice.

References

Al-Seghayer, K. (2001). The effect of multimedia annotation modes on l2 vocabulary Acquisition: a comparative study. *Language Learning & Technology.* University of Pittsburgh.

Brewster, S. (2011). *Skyline. Students' book.* Macmillan Heineman.

Callella, T. (2004). *Greek and Latin roots.* Creative Teaching Press.

Chapelle, C. (2001). *Computer applications in second language acquisition.* New York: Cambridge University Press.

_____ (2003). *English language learning and technology.* Amsterdam: John Benjamins.

Chapelle, C. & Jamieson, J. (2008). *Tips for Teaching with CALL: Practical Approaches to Computer-assisted Language Learning.* Pearson-Longman.

Chun, D. & Plass, J. (1996). Effects of multimedia annotations on vocabulary acquisition. *The Modern Language Journal, 80* (2), 183-198.

Chun, D. & Plass, J. (1997). Research on text comprehension in multimedia environments. *Language Learning & Technology, 1* (1), 60-81.

Cziko, G. & Park, S. (2003). Internet audio communication for second language learning: a comparative review of six programs. *Language Learning & Technology.* University of Illinois at Urbana-Champaign.

DeCarrico, J. (2001). *Vocabulary learning and teaching.* In Celcia-Murcia, M. (Ed.). *Teaching English as a second or foreign language* (pp. 285-299). Boston: Heinle & Heinle.

DeKeyser, R. (Ed.) (2007). *Practicing in a second language: Perspectives from applied linguistics and cognitive psychology.* Cambridge University Press.

Ellis, R. (1999). Item versus system learning: Explaining free variation. *Applied Linguistics 20,* 460-480.

Green, T. (2008). *The Greek and Latin Roots of English.* Rowman & Littlefield Publishers, INC.

Groot, P. (2000). Computer assisted second language vocabulary acquisition. *Language, Learning and Technology, 4* (1), 60-81.

Field, A. (2005). *Discovering statistics using SPSS.* London: Sage.

Huang, H. & Liou, H. (2007). Vocabulary learning in an automated graded reading program. *Language Learning & Technology.*

Izquierdo, J. (in press). Multimedia Instruction in Foreign Language Classrooms: Effects on the Acquisition of the French Perfective and Imperfective Distinction. *The Canadian Modern Language Review.*

Kawauchi, C. (2008). *Proficiency Differences in CALL Based Vocabulary Learning: The Effectiveness of Using "PowerWords". FLEAT 5,* pp. 55-65.

Laufer, B. & Hill, M. (2000). What lexical information do L2 learners select in a CALL dictionary and how does it affect word retention? *Language Learning & Technology, 3* (2), 105-118.

Lyman-Hager, M. & Davis, J. (1996). The case for computer-mediated reading. Une vie de boy. *The French Review, 69* (5), 775-790.

Lyster, R. (2004). Research on form-focused instruction in immersion classrooms: Implications for theory and practice. *Journal of French Language Studies, 14,* 321-341.

Mayer, R. (Ed.) (2005). *The Cambridge handbook of multimedia learning.* New York: Cambridge University Press.

Nikolova, O. (2002, January). Effects of students' participation in authoring of multimedia materials on student acquisition of vocabulary. *Language Learning & Technology, 6* (1), 100-122.

Nation (2001). *Level Tests Recognition. Level 1k, Test 1.* Retrieved from http://www.lextutor.ca/tests/levels/recognition/1k/test_1.html

Plass, J. & Jones L. (2005). *Multimedia learning in second language acquisition.* In Mayer, R. (Ed.). *The Cambridge handbook of multimedia learning* (pp. 467-488). New York: Cambridge University Press.

Wood, J. (2001). Can software support children's vocabulary development? *Language Learning & Technology, 5* (1), 166-201.

Yanguas, I. (2009). Multimedia glosses and their effect on L2 text comprehension and vocabulary learning. *Language Learning & Technology, 13* (2), 48-67.

Yoshii, M. (2006). L1 and L2 glosses: their effects on incidental vocabulary learning. *Language Learning & Technology, 10* (3), 85-101.

Yoshii, M. & Flaitz, J. (2002). Second language incidental vocabulary retention: The effect of text and picture annotation types. *CALICO Journal, 20*(1), 33-58.