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Word cards: an effective or an obsolete strategy to learn the spelling, meaning and grammatical function of new vocabulary

El uso de fichas: estrategia efectiva u obsoleta para aprender la forma escrita, el significado y la funcion gramatical de vocabulario nuevo

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Resumen

El objetivo de este artículo es presentar un análisis de los cambios en la cantidad de vocabulario en ingles que estudiantes principiantes pueden aprender en un cuatrimestre (14 semanas) mediante el uso de fichas. Los participantes tomaron una prueba previa al inicio de la investigación y una prueba posterior al final. Cada semana los estudiantes crearon fichas de palabras que no conocían de una lista de 512 palabras estudiadas anteriormente en dos cursos. Se utilizó un "t-test" para comparar los resultados obtenidos. Además, los participantes llevaron un control del tiempo que utilizaron repasando con fichas y completaron un cuestionario al final del cuatrimestre. Los resultados obtenidos en la primera evaluación general y en la segunda evaluación (71.66-87.33) respectivamente, muestran que hubo mejoría. Los resultados reportados son evidencia para afirmar que el uso de fichas como estrategia ayuda a aprender vocabulario rápidamente.

Palabras claves: uso de fichas, estrategia de aprendizaje, aprendizaje de vocabulario, inglés como lengua extranjera, conocimiento receptivo.

Abstract

The objective of this article is to present an analysis of the changes in the amount of English lexical knowledge that beginners can learn in a quarter (14 weeks) using flashcards. Participants took a pre and a post test. Each week, they made cards using unknown words from a 512-word list studied in two previous courses. A t-test was utilized to compare the results. Besides, participants kept tract of the time they spent using word cards and completed a questionnaire at the end of the quarter. Participants' scores in the pre and post-test show that there was positive improvement (71.66-87.33) respectively. The research study reported here provides evidence for the claim that the use of word cards as a strategy helps improve vocabulary knowledge quickly.

Key words: word cards, vocabulary learning strategy, learning strategy, English as a foreign language, receptive knowledge

Introduction

In the past, many English as a foreign (EFL) and second language (ESL) instructors neglected the role of vocabulary in their methodologies rendering teaching and learning vocabulary directly and training students in vocabulary strategies such as using word cards obsolete. According to Richards and Rodgers (2001), Communicative Language Teaching (CLT—main method advocated in Costa Rica by educational institutions) was supposedly going to give vocabulary a prominent place, but mastering of functional language and discourse were given a much more outstanding status, and CLT gave little guidance about how to handle vocabulary (Schmitt, 2000).

An important offspring of CLT was Task-Based Language Teaching (TBLT). TBLT is the

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realization of CLT at the levels of syllabus design and methodology (Nunan, 2006). Based on Richards and Rodgers' definitions (2001), TBLT is theoretically related to CLT, is organizationally determined by tasks, and is practically realized following a very specific procedure with a vocabulary focus that includes an analysis part and practice section (Willis, 1996).

It has now been realized that learning through input is not the best preparation for producing output and will not ensure the acquisition of adequate vocabulary or grammar (Griffin and Harley, 1996, as cited in Nation and Webb, 2011). Current best practices need to include both a principled selection of vocabulary, often according to frequency lists, and a well-balanced methodology that encourages meaningful engagements with words over a number of recyclings. One of the most important current lines of thought is the realization that grammar and vocabulary are fundamentally linked. Evidence from large corpora that have been collected shows that there is more lexical patterning than ever imagined (Schmitt, 2000). The *term language corpus* is used to refer to a collection of language data (written, spoken, or a mixture of the two) which has been organized to characterize a particular state or variety of a language (Sperberg-McQueenand Lou Burnard, 2004). ESL and EFL instructors should take advantage of the data obtained from the analysis of the available corpora in order to select language that resembles more closely the speech of native speakers.

Recently, well-known ESL textbook authors have given more importance to the learning of vocabulary in the books they design. Books such as *Touchstone I* (McCarthy, McCarten and Sandiford, 2005) include activities that involve the use of vocabulary learning strategies in each unit as well as a list of the 500 most frequently used words in the Cambridge International Corpus. *Attitude I* (Fuscoe, Garside and Prodromou, 2006) recommend the use of the *Macmillan Castillo bilingual dictionary* (based on the World English Corpus) and suggest the implementation and regular use of vocabulary learning strategies.

Access to corpora (databases with millions of real language examples) has influenced how to teach frequently used vocabulary and has highlighted the patterns where these lexemes occur. Q-Skills for Success (Scanlon, 2011; Lynn, 2011) is another example of a textbook that features a strong research-based vocabulary component—a learning-focused strand. These authors advocate the use of vocabulary activities to track students' success, treating them as autonomous learners, which in turn leads to better results. There is also an emphasis on dictionary skills similar to Fuscoe, Garside and Prodromou (2006) and the use of frequently used words such as the Academic Word List (AWL). *Touchstones, Attitude and Q-Skills* for Success are currently used in Costa Rica, but the impact of the implementation of vocabulary learning strategies such as word cards, has not been evaluated.

In Costa Rica, many efforts are being made to improve not only the students' but also the teachers' English level. However, according to a 2008 government-commissioned survey, only about 62 percent of Costa Rica's English teachers possessed the minimum required level to teach and just over one in 10 high school students had achieved an intermediate level or higher (Leff, 2010).

According to Schmitt (2000), understanding how vocabulary is acquired could help instructors teach *words* effectively and set realistic goals for their students to help them learn frequently used words independently. But, what are words? Because there is not a one-to-one correspondence between a single word and its meaning, the terms *lexeme, lexical item or lexical unit* have been created to define "an item that functions as a single meaning unit regardless of the number of words it contains" (Schmitt, 2000, p. 2). This definition avoids the ambiguity of the term word to adequately address vocabulary learning. Words (spoken or written) are everywhere, and sometimes teachers underestimate how complex it is to fully know a word.

Therefore, Schmitt (2000), in *Vocabulary in Language Teaching,* stresses that words are not learned instantly and that it takes multiple encounters with a word before it is acquired. The

simple yet often neglected implication for teaching English is that recycling of vocabulary needs to be part of every lesson and part of any student's extra-class work. In other words, students need to take responsibility for their own vocabulary learning outside the classroom because, as most EFL and ESL instructors would agree, there is not enough time in class to review vocabulary to achieve high levels of word knowledge and proficiency.

It is paramount for instructors to present vocabulary, recycle it, teach vocabulary learning strategies for consolidating a word once it has been encountered, specifically using word cards, and to systematically follow up on students' out of class efforts to learn explicitly taught vocabulary to assess their progress. Using *word cards* can achieve those objectives. In this article, a word card is defined as a small index card where the learner writes the word to be learned on one side and its corresponding translation on the other side in order to learn vocabulary explicitly.

Interestingly, deliberate vocabulary learning using word cards has not been generally considered positively by teachers. This attitude is partly the result of a reaction against language courses that did little else besides the deliberate study of vocabulary and grammar (Richards and Rodgers, 2001) and did not provide opportunities for language use and learning through use. Nevertheless, Nation (2007) states that a well-balanced language course has to consist of different strands. He proposes including the following four elements into a course to achieve a desirable balance: (1) meaning-focused input, (2) meaning-focused output, (3) fluency development and (4) language-focused learning, in which, there clearly can be a useful role for deliberate vocabulary learning (Nation, 2011).

Nevertheless, few investigations have been carried out to confirm or reject Nation's proposal. In this respect, this article presents the results of research study conducted in an English course offered by The National University of Distance Education (UNED) designed for high beginner students in order to measure the amount of lexical knowledge of selected words that participants can learn in a quarter (14 weeks) using word cards.

Theoretical Framework

The nature of vocabulary learning

Paul Nation's components of word knowledge provide the theoretical framework to understand vocabulary learning. For the present purposes, the terms learning and acquisition will be used interchangeably. Nation states that knowing a word entails having mastery over various kinds of lexical knowledge. At the most general level, knowing a word involves mastering its form, meaning and use. To know the form of a word involves recognizing and producing its *written form*. To master the meaning of a word includes knowing its form and meaning. Finally, to know how to use the word implies distinguishing its *grammatical function* (Nation, 2001).

According to Schmitt (2000), language learners are able to acquire an impressive amount of vocabulary if opportunities are provided. This implies two main processes of vocabulary acquisition: explicit learning through the focused study of words and incidental learning through exposure when one's attention is focused on the use of language rather than the learning of the language. However, Schmitt and Nation (as cited in Schmitt, 2000) agree that there is not a complete theory of how vocabulary is acquired because there are so many different variables that affect second language vocabulary acquisition that it is very difficult to state a theory of acquisition that can account for all. Therefore, empirical studies to support the use of specific vocabulary learning strategies are paramount. It is also vital for instructors to include a principled and balanced program with different activities that promote implicit and explicit vocabulary learning, such as using word cards. To do so, there are important aspects to consider when teaching vocabulary.

Nation and Webb (2011) concur that vocabulary instructors have four important jobs in their classroom. The first and most significant job of vocabulary instructors is to make sure students focus on the most important vocabulary for them (generally frequently used words) and get an

adequate balance of learning chances. Nation (2007) suggests following the principle of the four strands to ensure a balance. Specifically, this principle states that an equal amount of time needs to be spent on each strand and corresponding suggested activities. First, instructors need to include reading graded books, listening to stories and engaging in communication activities as part of the so-called meaning-focused input strand. Second, they should incorporate communication activities with written input as part of the meaning-focused output strand. Third, reading easy graded readers, repeated reading, speed reading, listening to easy input, and rehearsed tasks and writing ought to be part of the fluency development stand. Last but not least, teaching and learning vocabulary directly and training students in vocabulary strategies has to be equally included as part of the language-focused learning strand, which is usually neglected due to time constraints. Nevertheless, the activities in the fourth strand make up probably less than one-eighth of the time in a course. So, there is no excuse for excluding activities to teach vocabulary directly within a well-balanced course.

The second most important job of a vocabulary teacher is to train learners in the use of strategies such as learning from word cards and using a dictionary as current researched-based textbooks on the market advocate (McCarthy, McCarten and Sandiford, 2005, Fuscoe, Garside and Prodromou, 2006, Scanlon, 2011 and Lynn, 2011). The third most important job is to test and monitor students in and out of class, so they get a program suited for their proficiency level. Finally, the fourth most important job is to teach vocabulary using vocabulary teaching techniques.

After presenting how vocabulary teaching fits into a course to achieve a well-balanced course, choosing the most effective techniques is important (Nation & Webb, 2011). Research on vocabulary teaching techniques can determine this information. Laufer and Hulstijn (2001) suggest using the Involvement Load Hypothesis (ILH) technique and Nation (2001) prefers using Technique Feature Analysis (TFA). According to Hosenfeld (1976), another way to determine if a vocabulary activity is effective is to observe learners thinking aloud during or after a vocabulary learning activity. Hulstijn and Laufer (2001) state as a third viable way to establish whether a technique is effective or not is to do experimental comparisons of vocabulary learning activities.

According to Nation (2011), the best known and best researched way of analyzing vocabulary teaching techniques is Laufer and Hulstijn's (2001) ILH. These authors explain that three factors are involved to evaluate an activity using ILH: need, search and evaluation. Each factor may be present (-), present with moderate strength (+), or present with full strength (++) in the technique or activity. Laufer and Hulstijn (2001) suggest three questions to evaluate each aspect: to evaluate need, one needs to ask: *is the unknown word needed to complete the task?* To evaluate search, one may ask *does the learner have to search for or retrieve the meaning or form of the word?* Finally, for evaluation, one could ask *does the task involve having to compare the form or meaning with other possible words or meanings in order to choose the most suitable one for the context?* Laufer and Hulstijn (2001) conclude that the sum of the strengths represents the involvement load of the task. The greater the involvement load, the better the learning. The highest score that could be obtained using ILH is four.

The basic idea behind the ILH is that the design of the task determines the quality of the learning outcome. The mayor theory construct supporting this is Craik and Lockharts's (1972 as cited in Gass and Selinker, 2008) levels of processing theory which states that the quantity of learning depends on the quality of the mental activity in the brain at the moment that learning occurs. The deeper the processing, the better the learning. The ILH has been tested in several published experiments (Hulstijn and Laufer 2001; Folse 2006; Kim 2008; Keating 2008; Webb 2008).

Encouraged by ILH, Nation (2001) supports the use of another technique analysis system (Technique Feature Analysis-TFA). He states that to evaluate and design techniques, a more elaborate

set of criteria is needed. His technique involves analyzing the goals, learning conditions, signs, and design features of vocabulary-learning-focused activities. He proposes a checklist with eighteen questions. The highest score using Nation's checklist is 18, one per statement.

To illustrate how word cards are implemented for receptive learning in a well-balanced course, Nation (2011) clarifies that learning vocabulary using words cards just involves writing unknown L2 words or phrases on small cards and writing the L1 translation on the other side. The learner goes through the cards at increasingly spaced intervals until the meanings (translations) of the words are known. On the other hand, by looking at the translation and trying to recall the L2 word forms, productive learning can also occur. In the analysis of this technique, only receptive learning has been considered (written form, meaning and grammatical function). **Table 1** is a summary of the analysis of ten different classroom activities comparing ILH and TFA scores to illustrate each activity's effectiveness.

Table 1: Comparison of involvement load and technique feature analysis of ten activities

Activity	Involvement load	Technique feature analysis
Fill in the blanks	4	8
Find the word in the text	4	8
Write with target words	3	8
True/false	3	6
Reword the sentence	3	6
Multiple-choice on text	3	6
Word cards	3	11
Read and choose definitions	3	6
Reading plus fill in	2	7
Reading with glosses	1	5

Source: Taken and adapted from (Nation & Webb, 2011, p. 14)

Interestingly, word cards are rated the highest by TFA with a score of 11 and has a moderate score of 3 on IL only topped by *Fill in the blanks and Find the word in the text.* In short, the use of word cards appears to be quite effective and efficient for acquiring receptive word knowledge (meaning, form and use of lexical items) based on ILH and TFA results.

Observing vocabulary teaching techniques in use

Another way to gather information about teaching techniques is to observe learners using them and to question learners about their use, which is surprisingly an under-researched area. Moir and Nation's (2002 as cited by Nation and Webb, 2011) study of learners reflecting on their vocabulary learning is one example at a more general level, but studies focused on particular techniques may provide valuable information in evaluating and redesigning learning activities.

Experimental comparison of vocabulary learning activities

The third way of deciding whether one activity is more effective than another is to compare them by means of an experiment. To illustrate, Keating's (2008) research question was, "Do tasks with different involvement loads result in different word learning gains?" The independent variable was involvement load. The first treatment (1) included a one-involvement load activity, treatment 2 included a two-involvement load activity and treatment 3 a three-involvement load activity such as word cards. The test was to translate L2 words into L1 (receptive knowledge) and translating L1 sentences containing target words into L2 sentences (productive knowledge). The results support the ILH. Another study that also used ILH as the independent variable for the retention of ten target words was conducted by Hulstijn and Laufer (2001). The test involved the learners translating 10 target words into their L1 or giving L2 explanations of the meaning. The learners were from two different countries with rather different cultures which supports generalization to a wide range of learners. The results again supported the ILH.

Conducting technique analysis (Laufer and Hulstijn, 2001; Nation, 2001), observing learners thinking aloud during or after a vocabulary learning activity (Hosenfeld, 1976) and doing experimental comparisons of vocabulary learning activities (Hulstijn and Laufer, 2001) encompass the main ways to determine whether an activity to learn vocabulary is effective or not. Experimental comparison studies also demonstrate that word cards are effective, which totally support their use in a well-balanced course.

According to Nation (2011), using word cards is a very effective strategy for learning word forms and their meanings. There have been many experiments focusing on this kind of learning, and word cards have been proved to be a very effective way of learning (Nation 2001).

Clearly, learning from word cards does not have to be a large part of the course, but because it is an extremely effective way of learning, it should be present and should be done in the most effective way following research-based guidelines for learning. First, students need to be trained to look at the word form and try to retrieve its meaning from memory (Royer 1973; Baddeley 1990 as cited in Nation and Webb, 2011). Second, students need to space retrievals increasingly instead of spending a long time learning the items. They need to do one or two repetitions and wait a short while increasing the time between repetitions (Dempster 1987 ; Pimsleur, 1967 as cited by Nation and Webb, 2011).Third, according to Kellogg and Howe (1971 as cited by Nation and Webb, 2011) and Laufer and Shmueli (1997 as cited by Nation and Webb, 2011), there are many ways of putting the meanings on word cards (L2 definitions, L2 synonyms, L1 translations, pictures, L2 contextual definitions), but the most effective has proven to be L1 translations. Fourth, it is also paramount to change the order of the cards in the pack, for it allows difficult words to get more repetitions and avoids serial learning, and to use small packs of words (20 words) at the beginning and larger ones when intuitions about spelling and pronunciation patterns have been developed (Crothers and Suppes, 1967, as cited in Nation and Webb, 2011). Fifth, Tinkham (1993) suggests not putting words with related forms or meanings in the same pack, for learning members of a lexical set is 50-100% more difficult. Finally, Ellis and Beaton (1993) recommend learners to say words to themselves, for stable pronunciations for the word makes remembering words easier.

There have been many criticisms of decontextualized leaning, but they are not supported by research. In short, deliberate decontextualized learning (using word cards) needs to be part of the language-focused learning strand of a course as suggested by Nation (2011).

Deliberate learning and implicit knowledge

In the last decades, a range of studies have been carried out to show that deliberate learning of vocabulary is effective to acquire implicit knowledge (Thorndike, 1908; Webb, 1962; Griffin and Harley, 1996; Nation, 2001 as cited in Nation and Webb, 2011). Recent studies have also looked at whether learning from word cards contributes to implicit knowledge. For clarity purposes, implicit knowledge is defined as subconscious, fluently available, and well integrated knowledge needed for normal language use (Nation and Webb, 2011). Elgort (2011) has shown that vocabulary knowledge gained from deliberate learning had those characteristics. This research is extremely important because it shows that thoughtfully learning words from word cards is not only effective, but provides the precise kind of knowledge. Steinel, Hulstijn, and Steinel's, (2007) study even showed that writing multiword units (phrases and sentences) on word cards is possibly as effective as just writing single words.

There is plenty of evidence to support direct learning from word cards as an efficient and effective practice, but not at the local level. Using word cards systematically as a vocabulary learning strategy can no longer take the backstage but a central position; thus, conducting an empirical research study in a Costa Rican context is justified and supported by international studies.

In order to evaluate students' competence in regard to the amount of lexical knowledge they can acquire using word cards, students were asked to fulfill the following specific objectives in a pre-test, in weekly short evaluations and in a final post-test at the end of the experiment:

1. To copy the lexical units accurately to show knowledge of its written **form**
2. To translate the lexical units selected from English to Spanish to show knowledge of their **meaning**
3. To recognize the grammatical function of the lexical units selected to show knowledge of their **use** re-state)

Evaluating the effectiveness of using word cards to learn the form, meaning and use of words previously studied in a high beginner Costa Rican university class encompasses in essence the specific objectives of this paper.

Methodology

Context of the study

This research study took place in a course offered by UNED (National University of Distance Education. UNED offers a free eight-course English program to its students. For the English courses, students usually meet once a week for four hours during a fourteen-week period. The group selected for this study had already taken the first two required English courses. The textbook for these two courses is *Attitude I*. Students have already covered units 1 to 6 in the first course and units 7 to 12 in the second course. Each unit has a wordlist with an average of fifty lexemes with their corresponding phonetic transcription and grammatical function. A total of 512 words were introduced in the last two courses.

When this empirical study took place, participants were taking course number three (the Pre-Intermediate course) using *Attitude 2* (Fuscoe, Garside & Prodromou, 2006). The main objective in the course program is to develop students' linguistic competence in English in the four main skills: listening, speaking, reading and writing.

Participants

There were 12 participants at the beginning of the research study, but 3 dropped out of the course. Therefore, only 9 students participated in the study: 6 women and 3 men with a high beginner level. Their ages ranged from 19 to 37. At the time of the study, they were pursuing four different majors: Business Administration, Education, Natural Resource Management and Tourism.

All the participants had limited time to complete school assignments. Six participants had scholarships which required many hours of community work. Five participants worked part-time, two worked full-time, and only two did

not work. In addition to the English class, three participants were taking two UNED courses, three were taking three classes, and three were taking four courses. In short, participants were extremely busy.

Method

This investigation utilized a mixed methods research, mainly quantitative. The quantitative phase included measurements, evaluation of theories, employed an experiment, a survey and pre-determined instruments (a pre and a posttest) to collect data to carry out statistical analyses (Creswell, 2003). However, qualitative data were also obtained to enhance the analysis of the results. In other words, quantitative and qualitative research techniques, methods, approaches, and concepts were mixed and combined into a single study (Johnson & Onwyegbuzie, 2004).

The aim of this research study was to measure the changes that the systematic use of word cards can bring about regarding vocabulary acquisition. It did so by implementing in the classroom research-based guidelines for vocabulary acquisition presented by accredited researchers, and utilizing pre-designed instruments to collect data related to three aspects that are integral parts of what is understood by *knowing a word.* The data gathered were analyzed statistically.

The Null Hypothesis was utilized in this research study. In simple terms, if the data gathered in the pre and post tests are analyzed using the Null Hypothesis, significant changes are not expected. However, if there are meaningful changes, the hypothesis is rejected. In order to reject or accept the Null Hypothesis, a *t*-test was utilized, which is a statistical hypothesis test that follows a Student's t-distribution if the null hypothesis is true ("Student's t-distribution," 2010). A t-distribution is a continuous probability distribution that arises in the problem of estimating the mean when the sample size is small (M. I. González, personal communication, October 6, 2010) as it is the case in this research study. If the result of the T-Statistics is > 1.86. (see appendix A), then the Null Hypothesis can be rejected and the results are considered significant (Giles-Peters, 2005).

The rejection of the Null Hypothesis was the goal of this research study because it was hoped to claim that using word cards as a vocabulary learning strategy can be a factor in the acquisition of vocabulary in a well-balanced course.

Procedures

The following steps were taken to carry out this research study. The first step was to request permission from the university authorities to conduct the study. Once permission was granted, the study was described to the students, and they were asked whether they were willing to participate or not. At first, a few of the students were reluctant to collaborate because they thought that the project was too demanding and implied additional work. However, they were finally convinced to participate.

Resources provided

Students were given a dictionary *(Macmillan Castillo Bilingual Dictionary, 2008)* and as many index cards as needed and told they could keep the dictionary and cards. This dictionary was chosen because it provides the frequency of words as determined by corpora studies. The selected dictionary uses black font to present the more specialized or formal entries and red font, followed by one, two or three stars, to present more frequent entries. The more stars the word has, the more frequent the word is according to the World English Corpus. The rationale for selecting just one dictionary was that if all learners worked with the same dictionary, they would be able to find the same translations, sample sentences, and frequency of the lexical items provided on the list given.

Pre-Test Design

During the first week of the experiment, a vocabulary pre-test was administered. This test evaluated 50 lexemes systematically taken from the twelve word lists studied in the previous two courses they had taken (50 words out of 512). In other words, roughly 10% (50 words) of the items were selected out of the 512 words included on the twelve

word lists. Only one-word lexemes were included to avoid using common phrases and expressions that are not labeled in the dictionary as frequent lexical items. Four to five lexemes from each unit were selected. The first 20 lexical units in the pretest are among the most frequent. That is, in the dictionary, they are printed in red and followed by three stars. The next 15 lexemes are considered very frequent. That is, in the dictionary, they are printed in red and followed by two stars. The next ten words are quite frequent. That is, in the dictionary, they are printed in red and followed by one star. The last five words are not frequent. That is, in the dictionary, they are printed in black and are not followed by any stars, for a total of 50 words.

Pre-Test Administration

On the day of the pre-test, a slip with all 50 selected words was given **(see appendix B)** to the students so that they could copy them correctly. Words were numbered from 1 to 50 for easy reference. This slip was accompanied by the pre-test designed to measure the amount of word knowledge (written form/copying the word, meaning/writing the translation, grammatical function/writing its function) they had already acquired in the previous two courses. The assessment instrument provided has three columns. In the first column, participants had to copy each of the 50 words from the list in the order provided. They were reminded to write the corresponding number next to the word for easy reference. In the second column, they had to write an appropriate translation of the word. They could not use their dictionaries. Finally, in the third column, they had to underline the grammatical function of the lexeme. They had five different options (V = verb, Adj. = adjective, S = noun, Adv. = adverb, & O. = other).

Word Card Training

After the pretest was completed, students were given a copy of all the 512 words from the previous two courses. Class time was used to train students on how to make and use word cards to recycle the vocabulary from the word lists that the participants did not know.

Students were immediately trained on how to make and use word cards appropriately in and out of class following research-based guidelines. After writing the words on individual index cards from the corresponding wordlist that each individual student did not know, students looked up each word and wrote the corresponding translation on the back of the respective index card. The inclusion of illustrations, semantic maps, phonetic transcriptions, sentence samples or any other aspect of vocabulary knowledge were optional. Then, to follow, Dempster (1987) and Pimsleur's (1967 as cited by Nation and Webb, 2011) guidelines, students were told to review the words on the word cards for a few minutes on the day they created them. They were told to do the same on the following day, a week after, a month after and six months later. They were told to look at the English word and then try to say the translation and the other way around as well. During the review sessions, they were told to place the words they did not know at the beginning of the pile to review them again using a different order because it is more effective. The words they knew could be put away, keeping only word cards they did not know. **Table 2** shows the pre-established schedule followed to conduct the experiment.

Table 2: Pre-established weekly schedule to make and evaluate word cards, record time spent, and provide feedback

Week	Make word cards	Evaluation	Record Time making and reviewing word cards (5 to 10 mins recommended)	*Provide results of weekly evaluations*
		Pretest		
1	Units I and II		✓	
2	Unit III	Units I and II	✓	
3	Unit IV	Unit III	✓	✓
4	Unit V	Unit IV	✓	✓
5	Unit VI	Units V	✓	✓
6	Unit VII	Unit VI	✓	✓
7	Unit VIII	Unit VII	✓	✓
8	Unit IX	Unit VIII	✓	✓
9	Unit X	Unit IX	✓	✓
10	Unit XI	Unit X	✓	✓
11	Unit XII	Unit XI	✓	✓
12		Unit XII	✓	✓
		Posttest Questionnaire		✓

Source: Taken and adapted from (Nation & Webb, 2011, p. 14)

Throughout the quarter, the instructor encouraged participants to keep a weekly record of the time, expressed in minutes, that each participant spent working with word cards, in and out of class, to remind learners of the effectiveness of following expanded rehearsal guidelines. This information was also useful to determine the students' commitment to the project. Word cards were made and reviewed each week in class. Furthermore, four randomly selected words from the vocabulary reviewed the previous week were evaluated using the same format in the pretest and the corresponding feedback provided. The purpose of this activity was to highlight the benefits of reviewing vocabulary regularly and to motivate participants to use word cards. All the words students had selected as unknown were systematically recycled using word cards throughout the quarter.

Finally, an identical test (posttest) was administered at the end of the experiment to measure improvement on students' vocabulary knowledge. Once the post test was completed, a statistical analysis of the test was performed using the Null Hypothesis as the method to prove that change took place due to the intervention. All the changes in each of the areas of vocabulary knowledge: written form, meaning/translation, and grammatical function were analyzed, and results were discussed.

Self-evaluation questionnaire

On the last day of the quarter, a two-part-self-evaluation questionnaire was given to participants in order to qualitatively compare their opinions about the use of word cards with the statistical analysis obtained using the Null Hypothesis. The first part of the questionnaire is a self-evaluation of the acquisition of vocabulary. It is a chart divided into two columns preceded by the following heading: From the 512 words/phrases included on the list of

vocabulary provided for this research study I can... The first column included all the aspects evaluated in the pre and posttest: recognize the written form, write the meaning/translation, and recognize the grammatical function. The second column included numbers from 0 to 100 in tens (0-10-20-30…100%). Participants were asked to circle the percentage that best represented their current vocabulary knowledge of the aspects evaluated in the pre and posttests.

The second part involved completing phrases and answering questions about using word cards. Participants were asked to state whether or not they had forgotten any of the items evaluated when they took the same pretest as a posttest. They had to write the approximate number of items forgotten and the reason(s) for not remembering those items. Finally, they were asked if they were going to continue using word cards and why.

The results obtained from this questionnaire were compared with the results gathered in the statistical analysis and the time spent creating and using the word card vocabulary strategy to evaluate students' progress.

Results and Analysis

This section of the research study includes an analysis of the data gathered in the pre-test and the post-test using the average scores, the standard deviations, and the t-test results. The information obtained with the timekeeping chart as well as with the final questionnaire was also analyzed from a qualitative point of view. It is important to remember that the use of vocabulary word cards in an English course was implemented in order to measure the amount of lexical knowledge that participants could acquire in a 14-week period.

Objective 1 and 2

Copying the lexical item was the first objective. Showing knowledge of the written form was achieved successfully as expected.

Translating the lexical units from English to Spanish was the second objective in this research study. According to the results, translating appeared to be difficult in the pre-test; however, post-test results showed a very positive change.

In the pre-test, each participant translated the same 50 selected lexemes for a total of 450 answers. The nine participants obtained a total of 285 correct answers, which represents a score of 63.33%. In the post-test, participants achieved a total of 376 accurate responses which corresponds to 83.56%. There was a 20.22% positive difference between the pre-test and the post-test results as **Table 3** shows.

Table 3: Difference between pre-test and post-test scores in translation of the 50 words/lexemes selected

Participants	Pre-test result	Post-test result	Difference
1	40	44	4
2	28	43	15
3	30	47	17
4	27	36	9
5	37	48	11
6	28	39	11
7	44	48	4
8	25	36	11
9	26	35	9
Totals	285	376	91
Average	63.33	83.56	20.22

A *t*-test was used to establish if there was a significant change due to the systematic use of word cards. **Table 4** shows that the group scored higher in the post-test than in the pre-test, and the SD of the pre-test (6.87) is higher than the SD of the post-test (5.38). The t-test (6.98) shows that this difference is significant at greater than 1.86, according to the Student's t table **(see appendix A)**. In other words, the critical value of the t-distribution with 8 degrees of freedom (1.86) < 6.98; therefore, the Null Hypothesis has to be rejected.

Table 4 : Comparison of pre-test and post-test scores on translation of words from English to Spanish assessed by means of the t test

Test	N	Mean	SD	T
Pre-test	9	63.33	6.87	6.98
Post-test	9	83.56	5.38	>1.86

The mean average scores (63.33 and 83.56) respectively indicate that the post-test mean average score is *significantly* higher than the pre-test mean average score which means that there is notable improvement. For this objective, the individual scores obtained by students are considered homogeneous. The average score on the post-test was closer to 100 and the standard deviation was also closer to zero. In other words, the most desirable outcome was obtained in this part of the research study, that is, when the average score of the post-test (83.56) is higher than the average score of the pre-test (63.33), but its standard deviation (5.38) is lower than the pre-test (6.87). In short, all the students had better performance in the post-test than in the pre-test which is a sought-after outcome.

Objective 3

Recognizing the grammatical function of the lexical units selected was the third objective in this research study. According to the results, recognizing the grammatical function in the pre-test appears to be more difficult than the first two objectives; however, post-test results showed the highest improvement.

In the pre-test, the nine participants obtained a total of 234 correct answers which represents a score of 52.00%. In the post-test, participants achieved a total of 352 accurate responses which corresponds to 78.22%. There was a 26.22% positive difference between the pre-test and the post-test results as shown in **Table 5**.

Table 5: Difference between pre-test and post-test scores regarding the recognition of the grammatical function of the lexemes

Participants	Pre-test result	Post-test result	Difference
1	36	46	10
2	34	46	12
3	32	44	12
4	16	21	5
5	33	46	13
6	10	39	29
7	18	33	15
8	26	39	13
9	29	38	9
Totals	234	352	118
Average	52.00	78.22	26.22

The *t*-test was used again to establish whether there was a significant change possibly due to the implementation of word cards. **Table 6** illustrates how the group scored higher in the post-test than in the pre-test, and the SD of the pre-test (9.20) is higher than the SD of the post-test (8.16). The t-test (5.93) shows that this difference is significant at greater than 1.86, according to the Student's t table. In other words, the critical value of the t-distribution with 8 degrees of freedom (1.86) < 5.93; therefore, the Null Hypothesis has to be rejected again.

Table 6: Comparison of pre-test and post-test scores regarding the recognition of the grammatical function of the lexemes assessed by means of the t test

Test	N	Mean	SD	T
Pre-test	9	52.00	9.20	5.93
Post-test	9	78.22	8.16	>1.86

The mean average scores (52.00 and 78.22) indicate that the post-test mean average score is *significantly* higher than the pre-test mean average score, which means that there is remarkable improvement. The average scores (52.00 and 78.22) and the mean scores respectively show the greatest improvement in the performance of students. Additionally, the scores obtained by students are also considered homogeneous because the SD in the post-test is lower than the SD of the pre-test and the average score in the post-test was closer to 100. In other words, the most attractive outcome was again achieved in this part of the research study, that is, when the average score of the post-test (78.22) is higher than the average score of the pre-test (52.00), but its standard deviation (8.16) is lower than in the pre-test (9.20). In other words, all the students had better performance in the post-test than in the pre-test which was the desired outcome.

In short, participants improved in every aspect evaluated in this research study.

Analysis of the results obtained with the Timekeeping chart

There seems to be a correlation between the improvements achieved, which was discussed in the previous section, and the time students spent practicing with word cards. Interestingly, 7 of the 9 (1, 2, 5, 6, 7, 8 and 9) participants used their word cards as recommended. The suggestions were to use the word cards for 5 to 10 minutes on the day of the review, the next day, a week later, and a month later. If this procedure had been followed literally, participants should have spent a total of 20 to 40 minutes each week using word cards. In a 12-week period, they should have spent a total of 220 to 480 minutes. Only two participants (3 and 4) spent more time using their word cards; the other seven fell in the appropriate range as shown in Figure 2.

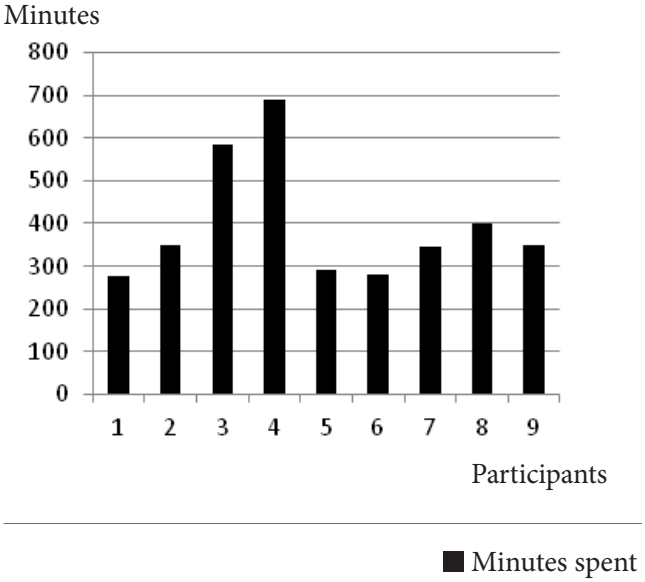

Figure 1. Minutes spent by each participant making and using word cards during a 12-week-period

Source: data obtained with the Timekeeping chart

Analysis of the results obtained with the final questionnaire

In the final questionnaire, most participants rationalized the fact that they had forgotten words by acknowledging that they had failed to review them. Others claimed that they had erroneously assumed that they already knew a given word and, therefore, had not made a word card to review it.

In addition, all participants claimed that they were going to continue using word cards to learn vocabulary. The reasons they provided are that word cards are useful, a good way to learn and review, easy to use, a good strategy, a good technique, the only way to memorize vocabulary, a way to learn better and easier, and finally a way to practice.

On the last day of this research study, participants evaluated themselves in each of the three aspects included in the pre and post-test. All the self-evaluations, except for that of number three, were higher than the scores that they actually received as Figure 2 shows.

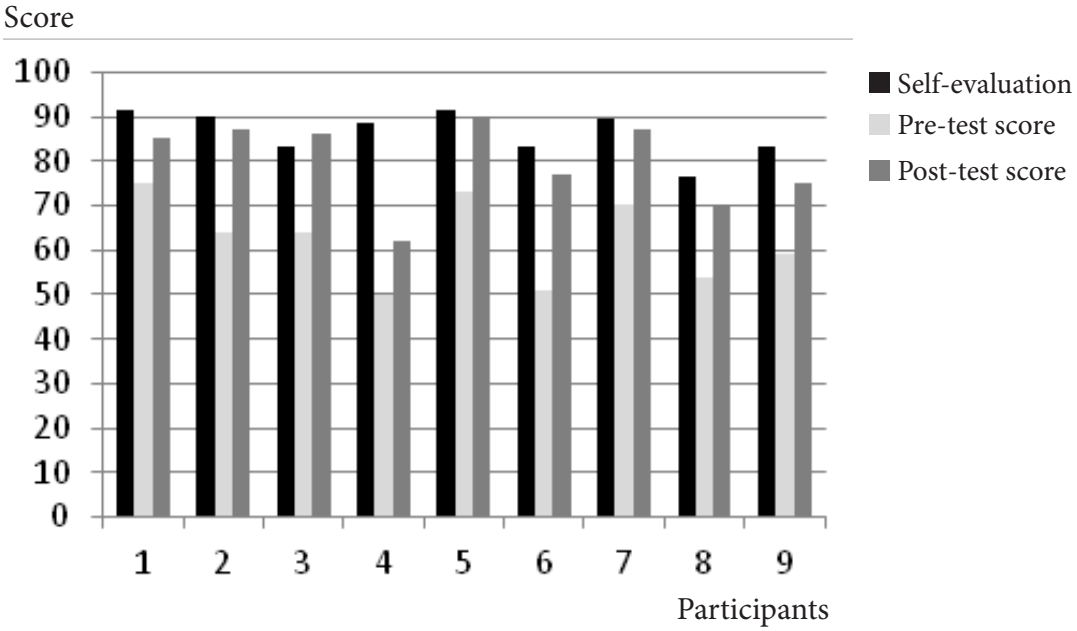

Figure 2. Comparison between the students' self-evaluation, and pre-test and post-test scores

Source: Pre and post test administered at the beginning and end of the course and final questionnaire

Participants were not far from the truth. The differences between actual scores and self-reports were only 2 to 6 points higher although participant 4 had a bigger difference. He obtained 50 points in the pre-test, 62 in the post-test, but his self-score was 83.33 as shown in Figure 3. According to Landauer and Bjork (cited in Schmitt, 2000), for review to be productive, it must be done for short periods of time and at increasingly longer intervals. Interestingly, participant number four, who received the lowest scores both in the pre and posttest, claimed having spent almost 700 minutes reviewing the vocabulary. This amount of time is higher than the average amount spent by his classmates. Furthermore, he stated that he used the strategy for periods of one hour at a time. His lack of improvement seems to lend support to Landauer and Bjork's claim, which states for review to be productive, it must be done for short periods of time and at increasingly longer intervals.

Most participants seemed to have an accurate estimate of their vocabulary knowledge. According to **Table 7**, copying the word is obviously the easiest vocabulary aspect evaluated.

Table 7: Comparison between self-evaluation and pre and post-test scores in all three aspects of vocabulary knowledge evaluated

Vocabulary Knowledge	Post-test score	Self-evaluation score	Decnereffi	Pre-test score
Copying the word	100	94	6	*100*
Translating the lexical units	84	89	-5	*63*
Recognizing the grammatical function	78	82	-4	*52*
Average score	**87.33**	88.33		***71.66***

However, some participants believe that copying a word from a list may still present some difficulties because their self-score average for that aspect is 94% even though their pre and post-test scores were perfect. Translating the words received the second highest score (84) in the post-test followed by recognizing the grammatical function (78).

Understandably, recognizing the grammatical function threw the lowest score not only in the pre-test (52), but also in the post-test (78), and it is the aspect with the lowest self-evaluation as well.

The overall self-score (88.33) is slightly above the real post-test score (87.33) with a 1% difference. However, the most important fact in this research study is the improvement obtained as we compare the pre-test score (71.66) to the post-test score (87.33). This progress shows that a significant change took place. The lack of a control group does not allow the researcher to state that this is due to the implementation of word cards with the population selected. It is very easy to criticize the lack of comparison group, but the strength of this empirical study is the attempt to show that busy students can quickly and effectively learn words presented in previous courses using word cards to be able to develop a large vocabulary size. Based on students' reaction to the pedagogical intervention, one is likely to believe that words cards are effective and help increase vocabulary size in a foreign language.

Conclusions

The research study reported here provides evidence for the claim that the use of word cards as a strategy helps improve vocabulary knowledge.

According to Nation (2001), not all aspects of word knowledge are addressed appropriately with word cards. Nation and the researcher of this study believe that the use of the strategy helps learners familiarize themselves with the general aspects (form, meaning and use) of vocabulary, as it is reflected on the results obtained.

Three components of word knowledge were analyzed to measure vocabulary learning. In accordance with Nation (2001), word cards are very effective to help learn the written form of the lexical units receptively and productively. The population in this study did not have any difficulties copying the words on their pre and post-tests as they obtained 100% accuracy on both occasions. This finding supports Schmitt's claim (2000) that spelling is one of the first aspects of lexical knowledge to be mastered.

Nation (2001) claims that word cards help learners acquire the meaning of words. Schmitt (2000) also states that, after spelling, the core meaning of the word is the second aspect learners acquire. Simply writing the translation of the lexeme on the other side of the word card provides learners

with an efficient tool to make numerous associations that can help learners acquire a generalized concept with its likely particular uses and range of referents. In other words, learners seem to effectively and efficiently learn the meaning of lexemes using word cards. In short, writing the translation of vocabulary words on the other side of the word card appears to be effective and efficient to learn meaning as the analysis of the results shows.

The systematic implementation of word cards in this research study apparently helped participants improve the recognition of the grammatical function of the lexical units selected. Nation makes a similar claim. The instructor simply suggested that learners write the grammatical function in their word cards. The word list provided also showed the grammatical function of the lexemes for easy reference when making word cards. Apparently, using word cards was more efficient and effective than expected because participants showed the highest improvement in this respect.

To conclude, the researcher agrees with Nation (2001) as he highlights that any one way of dealing with vocabulary is not completely successful in helping learners acquire knowledge of all aspects, and with Schmitt (2000) as he pinpoints that word learning is a complicated and gradual process. Thus, it is necessary to complement the use of the word card strategy with learning vocabulary in more contextualized ways and as part of a well-balanced course.

The use of word cards should not be just another strategy for students but a mandatory practice in any beginner English course. Instructors ought to train students on how to practice with word cards and provide time for its use during regular conversational beginner classes. It is of upmost importance to raise awareness of the significance of reviewing vocabulary systematically. If instructors neglect reviewing vocabulary taught in class, students will most likely forget it. The implementation of vocabulary cards as a learning strategy in beginner courses is not one more option. This strategy is affordable, efficient, effective, and easy to implement, and there are robust findings to support its use.

Students crave for helpful and easy strategies to learn. The myth that translation is not a useful strategy ought to be dispelled from students' and instructors' minds. Based on the results of this study, the researcher strongly recommends making word cards for all frequently used lexemes. Students just have to write the target lexeme on one side of the word card and the translation on the other side. Then, they have to use word cards systematically.

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Appendixes

Appendix A (Student's t Table)

df\p	0.4	0.25	0.1	0.05	0.025	0.01	0.005	0.0005
1	0.32492	1	3.077684	6.313752	12.7062	31.82052	63.65674	636.6192
2	0.288675	0.816497	1.885618	2.919986	4.30265	6.96456	9.92484	31.5991
3	0.276671	0.764892	1.637744	2.353363	3.18245	4.5407	5.84091	12.924
4	0.270722	0.740697	1.533206	2.131847	2.77645	3.74695	4.60409	8.6103
5	0.267181	0.726687	1.475884	2.015048	2.57058	3.36493	4.03214	6.8688
6	0.264835	0.717558	1.439756	1.94318	2.44691	3.14267	3.70743	5.9588
7	0.263167	0.711142	1.414924	1.894579	2.36462	2.99795	3.49948	5.4079
8	0.261921	0.706387	1.396815	**1.859548**	2.306	2.89646	3.35539	5.0413
9	0.260955	0.702722	1.383029	1.833113	2.26216	2.82144	3.24984	4.7809

As indicated by the chart above, the areas given at the top of this table are the right tail areas for the t-value inside the table. To determine the 0.05 critical value from the t-distribution with 8 degrees of freedom, look in the 0.05 column at the 8th row: $t_{(.05,8)} = 1.859548$ (1.86)

Appendix B (Word slip for pre and posttest)
Words evaluated in the pre and post test

1	Weekend	**12**	Degree	**23**	Rug	**34**	comfortable	**45**	Blond
2	Travel	**13**	Daughter	**24**	Reliable	**35**	Awful	**46**	Wallet
3	Terrible	**14**	Cheap	**25**	Quit	**36**	Whisper	**47**	sneakers
4	Say	**15**	Carácter	**26**	photographer	**37**	Thick	**48**	Lyrics
5	Run	**16**	Career	**27**	Pen	**38**	rainforest	**49**	janitor
6	Lucky	**17**	busy	**28**	leisure	**39**	plumber	**50**	considerate
7	Leave	**18**	aunt	**29**	Fail	**40**	Mug		
8	Hotel	**19**	angry	**30**	Drums	**41**	Jungle		
9	Healthy	**20**	advise	**31**	drawer	**42**	Jogging		
10	Gift	**21**	slim	**32**	Cool	**43**	enjoyable		
11	Die	**22**	sink	**33**	confident	**44**	chillout		