USING SEMANTIC MAPS AS A TEACHING STRATEGY FOR VOCABULARY DEVELOPMENT

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Abstract:
Semantic maps ensure a high potential to facilitate enhanced quality of understanding words. English as second language learners are often presented with new English vocabulary items that are often pre-organized in sets of semantically related words. However, there is an assumption that word grouping facilitates activities for vocabulary learning and no empirical justification supports employing this teaching technique. This study aims to examine to what extent semantic relatedness influences ESL vocabulary recall and retention for middle school students of Telangana. The current study was conducted with 30 seventh-grade students over six weeks. Learners were divided into two groups to compare the effects of presenting semantic maps (retention, recall) and wordlists (recognition, cued recall) for reading comprehension activities. The results reveal that both teaching strategies positively affect vocabulary recall and retention. Between these two strategies, semantic mapping yields better results on recall. The difference between the groups explains from the perspective of information process theory and memory model. Lastly, significant learning and the effectiveness of semantic maps were found in the experiment group.

Keywords: semantics maps, recall, retention, syntactic, wordlists, vocabulary learning

1. Introduction

Vocabulary is one of the significant components of language learning and is considered the most critical aspect of second language acquisition. It is challenging to learn a language without mastering the vocabulary, as learners find it challenging to communicate in a particular language. According to Laufer (1997:140), learning vocabulary is one of the essential elements, and without vocabulary, neither comprehension nor production of language is possible. Learning vocabulary cannot be separated from other language skills, such as listening, speaking, reading, and writing

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because the more words the learners know, they will understand what they hear or read. As English is a second language, remembering and recalling vocabulary seems complicated for ESL learners, especially while memorizing new words and enhancing their vocabulary knowledge.

One of the problems with using a wordlist is that some learners and some teachers focus solely on working with the list alphabetically, and students might not find the words in context in the materials they are reading. Another problem that might arise is that students may never practice the words in any meaningful way if they focus only on the spelling and meaning of words but not on using the words themselves in speaking and writing. Therefore, in order to get the real benefit from the wordlists, teachers need to make sure that they provide learners frequent encounters with the words being taught since it is crucial to vocabulary acquisition, and when students are exposed to the exact words many times, the result will be a higher degree of learning, an increased ability to remember and use the word. Therefore, the teachers should vary their strategy in teaching vocabulary and motivate the students to learn words actively and independently.

One of the strategies for teaching vocabulary is semantic mapping. According to Graves (2008:56), semantic mapping is one of the most potent approaches to teaching vocabulary because it engages students in thinking about word relationships. This strategy increases students' active exploration of word relationships; therefore, it leads them to a deeper understanding of word meanings by developing their conceptual knowledge related to words. Hence, this strategy can help students memorize new words quickly and effectively.

2. Review of Relevant Studies

2.1 Semantic Maps and Reading Comprehension

Teachers and language researchers attempted several teaching strategies for reading classes to foster vocabulary acquisition in long-term memory. One of these strategies is the use of semantic maps in teaching vocabulary. The strategy has some teaching privileges as it helps learners categorize words in the reading text through visualization (Duffy, 2009). Bear and et al. (2011) emphasize the importance of the strategy as it prompts learners to activate their schemata to learn highly specialized vocabulary in various disciplines. Therefore, integration of vocabulary items in a meaningful context through extensive reading can enhance better learning outcomes of both reading and vocabulary (Nagy, 2005). According to Rivers (1981), most words are introduced to the learner through reading texts. Nunan (1989) supported this notion by confirming that readers depend on vocabulary existing in their mental structures while reading as vocabulary consists of interrelating systems. Presenting items to learners in a systematized manner illustrates the original nature of vocabulary and at the same time enables them to internalise the items coherently. In recent years there have been numerous ESL textbooks, and many ESL learners are exposed to the English language through pre-organized semantic clusters, i.e., a group of words that share certain

semantic and syntactic similarities. These groupings such as *arm, leg, toes, fingers* are presented as a lexical set (Gairns and Redman, 1986), whereas semantic maps are categorical structuring of information in graphic form (Pittelman & Heimlich, 1986:779) that help categorize word meanings and the key attributes by distinguishing one word from another. The brainstorming phase of semantic maps gives educators insight into their learners' schemata. Thus, it shows interest, level of readiness, gaps, misconceptions, and errors (Johnson & Pearson, 1978). Ideas from one student will trigger ideas from the other students in a chain reaction thought process (Heimlich & Pittelman, 1986: 34).

2.2 Wordlists

Wordlists are prepared to study L2 vocabulary in lists and sentences to improve students' knowledge base and retention of vocabulary. According to Mehrpour (2008), wordlist strategies study words in lists to explain their meanings in the target language or with a translation of their meanings in the first language for longer memorization of words. Several studies suggest that increased amounts of rehearsal lead to a higher probability that an item will be transferred to long-term memory(Atkinson & Shiffrin, 1968; Waugh & Norman, 1965) or leads to stored images of greater strength, which are then more easily retrieved from memory (Gillund & Shiffrin, 1984). An explicit strategy for vocabulary acquisition is learning words from a list. Recent research indicates that working with a word list can be a very efficient means of acquiring L2 vocabulary (Nation, 1995; Meara, 1995), and vocabulary learned in lists is found to be resistant to decay and can be retained over several years (Hulstijn, 2001; Nation, 2001). Using lists and cards facilitates self-directed learning and learner autonomy, as learners may work at their own pace (Nakata 2008:7). Shillaw (1995) reports success in a semester-long project using word lists with students at a Japanese university. Thornbury (2002) points out the value of learning from a list may have been underestimated and suggests several techniques for using word lists in the classroom. Recent research into list learning and the development of new pedagogical methods for exploiting lists suggests that teachers of second languages are taking a renewed interest in using word lists for vocabulary instruction.

2.3 Semantic Maps as a Teaching Strategy

In vocabulary teaching, semantically related words are the sets of words that have certain connections, share common meanings, or compose a network of meanings. The pragmatic benefit has possibly contributed to the popularity of lexical sets in some widely listed coursebooks for English classes (Nation and Waring, 1997). Developments in "*lexical semantics*" have prompted the development of the "*semantic field theory*," "*semantic networks*," or "*semantic grids*," which organize words in terms of interrelated lexical meanings. The "*semantic field*" theory suggests that the lexical content of a language is best treated not as a "*mere aggregation of independent words*" but as a collection of interrelating networks or relations between words (Stubbs, cited in Amer, 2002). It is noteworthy that words may be grouped (related to each other) according to different criteria. Animals, for example, may be grouped in terms of physical features; grouped in terms of nonphysical features such as pet, wild, food, etc. (Gairns and Redman, 1986).

Moreover, coursebook authors who favor lexical-sets have believed that showing the connections among words promotes learners' vocabulary concept learning (Folse, 2004). First, one rationale for presenting related words can be drawn from meaningful learning and distinguished between rote learning, a passive process, and meaningful learning, the active process of relating new information or concepts to learners' prior knowledge. Specifically, a spreading activation model proposed by Collins and Loftus (1975) is one of the frequently cited theories to support the use of lexical-sets in vocabulary teaching (Bolger & Zapata, 2011; Hashemi & Gowdasiaei, 2005). In this model, the network consists of nodes representing words and lines between nodes representing the connection between words. The length of the line shows how strongly the words are semantically associated (Randall, 2007). Once a specific node in a network is initiated, this activation spreads through the whole network, thus leading to the activation of other nodes (Collins & Loftus, 1975). The spread activation primes the other nodes within the network and results in a faster process (Randall, 2007). Simultaneous presentation of related words possibly strengthens the links between words and facilitates vocabulary learning. Additional theoretical support is found in the levels-of-processing theory (Morin & Goebel, 2001; Shapiro & Waters, 2005). Researchers have noted that recognized information can be processed at various levels, from shallow to deep and that the amount of cognitive effort given to the process determines the retention quality. Proponents of lexical-sets claim that when related words are presented at the same time, learners benefit from comparing, contrasting, and organizing or chunking the words (Chin, 2002; Hashemi & Gowdasiaei, 2005; Jullian, 2000; Randall, 2007; Seal, 1991).

3. Methodology

This study investigated the role of vocabulary instruction associated with the use of long-term memory and explored whether semantic maps help learners in better retention and recall of vocabulary compared to wordlists. It also tried to search for an effective strategy to be employed in the classroom to foster longer retention of words by exploring the effectiveness of two strategies and comparing the results to know the effective strategy that can be used in the classroom to promote students' vocabulary knowledge level and retention and are semantic maps effective in retention of L2 vocabulary.

3.1 Subjects
Two groups of ESL students were chosen to explore the effectiveness of both semantic mapping and wordlist strategies. These students were 30 seventh grade ESL learners with a mean age of 12 years (SD=1.62), fluent in Telugu and Hindi, and learning English formally from grade I. The subjects were divided into the Experimental Group (EG) and the Control Group (CG). The EG (n=15) received the Semantic mapping strategy as the treatment, and CG (n=15) received the wordlists strategy. All the students had six years of experience in the target language with a proficiency level ranging from high beginners (A2) to low intermediate level (B1) and understood simple texts and used vocabulary in conversations and writing. They were proficient in reading skills but were not

comfortable while speaking. The following table gives information about the participants' linguistic backgrounds. Data was collected using a questionnaire administered before the experiment.

Table 1: Linguistic background

	Minimum	Maximum	Mean
Age	11	13	12
Beginning age for English	6	9	8
Years of formal instruction	4	6	5
% of English they use in a day	25%	75%	50%
Level	A2	B1	A2, B1

The average rating of the skills was – Reading1, Listening2, Writing3, Speaking4 (1 most comfortable, 4 least comfortable). The questionnaire responses show that school is the primary source of L2 exposure, and teachers are the only model for most learners. Few learners mentioned 'tuition' and 'home' as additional sources. While school is the place of L2 use for all of them, some of them mentioned they use L2 at home and 'playground' with 'friends.' Most students said their sources of L2 exposure are 'teachers,' 'school,' and 'tuition.' Places where they use L2 include the school and the home for some, and also the 'playground' for some were indicating peer interactions in L2. Their responses also indicate a range of literacy practices at home and school, such as book reading, digital media such as movies and the internet, which means they have exposure and opportunities to use L2 in the overlapping domains of home and school.

3.2 Research Questions
An effective strategy needs to be employed in the classroom to foster longer retention of words. The following research questions helped find out the efficacy of the two strategies:
1) Do semantic mapping and wordlist strategy play a significant role in promoting students' knowledge and retaining L2 vocabulary?
2) Which strategy has a more significant influence on students' retention of L2 vocabulary: semantic mapping or wordlists?

3.3 Materials and Data Collection
For this research, words for the vocabulary test were drawn from units 6 and 7 of the grade VII Students' English Coursebook. First, the words' frequency was considered essential for the learners as most of the words are repeated, and it was assumed that recall would be easier. Second, the words had to be familiar to the learners. Third, various word forms were selected as similar forms confuse comprehension (Laufer, 1990). A proficiency test, two reading comprehension texts with intermediate-level vocabulary, a pre-test and a post-test with questions which included comprehension and retention questions, a video, a writing task, and a feedback form were used. This research was carried out through reading and writing modules. Subjects were divided into two groups, an Experimental Group (EG) and Control Group (CG). Forty target words were

selected and made a list and verified the familiarity of the possible target words, and a pre-test was administered. The evaluation of pre-test data revealed that few words were known to some of the subjects. Known words were eliminated, and additional words were added. Before and after the experiment, both groups were given pre-test and post-test to understand the vocabulary levels. The pre-test contained 25 multiple-choice test items to investigate the homogeneity of learners' vocabulary knowledge. This test was given to both the experiment and the control group. Following the pre-test, three vocabulary lessons (reading comprehension texts) were given to the EG using semantic mapping strategy while the CG continued with the wordlist and traditional vocabulary teaching techniques. In other words, each treatment of the intervention process was presented through semantic maps vocabulary teaching technique with a six-step procedure for EG and wordlists with traditional teaching techniques for the CG. After the intervention and completion of vocabulary lessons, the experiment and the control groups were administered the post-test. For the post-test, similar items were employed which were used for the pre-test. The pre-and post-test scores were compared using paired t-test.

It was an in-class teaching model for six weeks with 1 hour per day. In the first class, the participants were given a proficiency test with multiple choice questions with ten 'high beginners' level vocabulary and ten 'low intermediate' level vocabulary taken from the Coursebook compared to Paul Nation's word list. They were given 15 minutes to mark their responses, and the sheets were collected. In the remaining time, the participants were exposed to semantic frames- a method to learn existing and new vocabulary, through a text. They were asked to read the text and underline the words they felt were complex to comprehend. A pre-test was given to check their comprehension and retention of words. The first ten items had vocabulary which demanded their meanings and the second ten words had meanings that demanded exact words. Then input was provided using the semantic frame technique. The subjects were given a post-test worksheet that included the same questions as the pre-test on the second day. Their responses were collected.

In the second half of the session, a domain was chosen – cooking. A cooking video was chosen, and a framework was made with 15 possible words that can be used to explain the process. Then all those words were provided as input and their meanings using the semantic frame technique. A cooking video was played, and the learners were asked to write a recipe on their own using the input provided to them to check their comprehension and retention of the words. Their responses were collected.

Table 2: Methods

	Comprehension	Retention
1.	Words were given and meanings were asked.	Meanings were given and words were asked.
2.	Use words or their meanings provided in the framework while writing the recipe.	Use the exact words provided in the framework while writing the recipe.
3.	Place the words under correct headings.	Meanings were given and words were asked.

On the third day '*house*' domain was chosen. Different words related to the domain were provided in a box and their meanings. Then four prompts were given, and the learners were asked to arrange the words under appropriate prompts. Prompts aided in understanding their comprehension skills. In order to assess their retention capacity, a test was given, which included meanings or explanations of particular words in which the learners were asked to write the accurate vocabulary. Their responses were collected and recorded. Finally, a feedback form on 'Semantic frames effect on learning second language vocabulary' was given to the participants, and the responses were recorded.

For implementing the wordlist strategy each week, target words were chosen from the course books. An academic pool of words was compiled using lextutor.com. This list included forty most frequent words, and these words were written on colourful flashcards; and after being presented to the students in context, they were added to the list on the wall every day. Therefore, the teacher compiled the list rather than asking the learners to do so. There were two lists on the walls. Each day a revision activity was conducted, and when students knew the word, the word appeared in the *user list*, but when they could not, it was put in the *lost list*. Knowing the word included aspects of word knowledge such as part of speech, synonyms, antonyms, collocations, and example sentences. In addition, to use it/lose it activity, the implementation schedule also included different comprehension and retention activities.

4. Results and Discussion

This study employed a mixed-method design to answer key research questions. Students' responses to the comprehension items (multiple-choice, translation, words in context, words in isolation) were scored. The test result was analyzed using the t-test formula to determine whether there was a significant difference between pre-test and post-test between EG and CG groups and to know which strategy was more effective. The standard deviation was computed before counting the t-test. Quantitative analysis of comprehension scores was performed using ANOVA to determine statistically significant differences between the means of scores in the two strategies (semantic mapping and wordlists).

4.1 Pre-Post Test Findings of the Experiment Group (EG)
A pre-test was conducted at the beginning of the study to know the students' vocabulary mastery early before getting treatments. The students had to answer 25 multiple-choice items in the pre-test in 40 minutes. The results were compared to the post-test, which

followed the same pattern. Some learners gave either the exact answers in both these tests or did not respond to unfamiliar questions. Few learners tried to explain the answers for the comprehension questions in the way they understood it rather than giving the accurate answers given as inputs. In the retention test, instead of writing the exact word, the learners used another word that was related to the prescribed word through their comprehension of the word. For example, the actual word was snatch. The meaning of the word was given through the inputs provided. The learner had understood the word's meaning but could not retain it. So, when they were tested for the actual word, one of the subjects had written '*stealed*' (stole), which is nearest in meaning to the prescribed word. This word was probably drawn from their schema, which they had acquired in their past years of studying.

The results are presented in the following table:

Table 4: Pre-Post test findings

EG	N	Mean	SD	t-value	p-value
Pre-test	15	3.0	1.77	3.98	0.33
Post-test	15	18.4	5.97		

The mean score of the group at the beginning of the experiment is 3.0 (N = 15 & M = 3 & SD = 1.77), and at the end of the experiment is 18.4 (N = 15 & M = 18.4 & SD = 5.97). It shows a big difference in students' knowledge level of the target words before and after the experiment (15.5). The difference in the mean scores before and after the experiment using ANOVA is identified at 0.00 (P-value = 0.00 & T-value = 3.98). When the statistical significance of the mean scores is set at 0.05 or lower (P <= 0.05), this means that the above value (0.00) indicates a statistical significance. Therefore, the results indicate a statistical development in vocabulary knowledge level before and after the experiment to a significant degree.

4.2 The Results of Pre-test and Post-test of the Control Group (CG)

The mean scores of the control group in the pre-test and the post-test are compared using the descriptive statistics tool to investigate the development in students' knowledge level of the target words within the control group over a six-week period which is the period of the experiment. The below table explains the difference.

Table 5: Pre-test and Post-test results

CG	N	Mean	sd	t-test	df	Sig (2-tailed)
Pre-test	15	2.4	1.59	2.18	14	0.00
Post-test	15	14.7	3.08		21	0.03

The big difference in the mean scores indicates a considerable development in students' vocabulary knowledge after the wordlist strategy is employed. The results were compared using ANOVA to ascertain whether the difference in the mean scores is statistically significant. As illustrated in table 2 &3 the mean score of the control group at the beginning of the experiment is 2.4 (N = 15 & M = 2.4 & SD = 1.59), and the mean score

of the experimental group at the end of the experiment is 14.7 (N = 15 & M = 14.7 & SD = 3.08). There is a big difference in students' knowledge level of the target words before and after the experiment (12.3). It suggests that the use of wordlists in the classroom promotes students' knowledge level of L2 vocabulary. The above figure shows that the difference in the mean scores of the control group before and after the experiment using ANOVA is identified at 0.00 (P-value = 0.00 & T-value = 3.75). When the statistical significance of the mean scores is set at 0.05 or lower (P <= 0.05), this means that the above value (0.00) indicates a statistical significance. Therefore, the results indicate statistical development in vocabulary knowledge levels before and after the experiment.

4.3 Mean Scores Differences between Pre-Test and Post-Test of Experimental Group and Control Group

The significant difference in the experiment could be seen through the difference in means scores in the two groups. The explicit comparison of mean scores between the two groups can be seen in the following table:

Table 6: Mean Scores Comparison

Group	Pre-test	Post-test
EG	2.4	18.5
CG	3.0	14.7

The mean score of the pre-test of the experimental group the table below shows that the mean score of the pre-test in the experimental group was 2.4. Meanwhile, the mean score of the post-test was18.5 The percentage of the students' improvement in this group is higher when compared to the Control group. Therefore, there was a significant improvement between the pre-test and post-test scores achieved by the experimental group students.

On the other hand, the control group's mean scores also showed an improvement. In this group, there was a minor improvement than the experimental group. The improvement was only 4.3%. The difference means score in the experimental group was higher than in the control group. It is concluded that there was a better improvement of the experimental group's achievement after receiving the treatment by using the semantic mapping strategy compared to wordlists.

5. Conclusion

This study concludes that introducing and giving more practice using semantic mapping effectively enables the students to achieve more significant progress in vocabulary learning. As a result, the students had positive attitudes towards this method. The findings were consistent with the literature review and supported the research on using semantic mapping. The findings and analysis implied that semantic mapping could improve students' vocabulary comprehension and is promising for teaching and learning. Therefore, the current study suggests that language teachers may be better off

going to the class with no static or preconceived maps or graphs to maximize the benefit of using semantic maps as a vocabulary teaching strategy in the classroom.

Conflict of Interest Statement

The author declares no conflicts of interests.

About the Author

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