

A MODEL FOR ENHANCING EFL FRESHMAN STUDENTS' VOCABULARY WITH MIND-MAPPING SOFTWARE

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Abstract. *Results of a vocabulary pretest showed that students majoring in translation had several weaknesses such as: poor vocabulary knowledge, faulty pronunciation, inability to connect the pronunciation with the written form, relating words to their part of speech, poor spelling, and inability to categorize words into groups sharing the same semantic feature and others. This article shows EFL (English as a foreign language) instructors how mind-mapping software can be used to help students learn vocabulary effectively. Instruction with the mind-mapping software goes through six stages: orientation, presentation and modeling, guided practice, independent practice, extension activities, and assessment with examples of vocabulary mind-maps. Comparisons of vocabulary pre and posttest scores of students who used vocabulary mind-maps and those who did not, showed significant differences in vocabulary acquisition as revealed by the posttest. Students who used vocabulary mind-maps made higher gains in vocabulary acquisition and more accuracy in vocabulary knowledge.*

Key words: *mind mapping, concept mapping, EFL, vocabulary, freshman students*

1. INTRODUCTION

A mind map is a graphic organizer in which the major categories radiate from a central image and lesser categories are portrayed as branches of larger branches (Budd, 2004). It can be used to generate ideas, take notes, develop concepts and ideas, and improve memory (Buzan, 2000). It is a powerful tool that teachers can use to enhance learning and create a foundation for learning. It is helpful for visual learners as they are illustrative tools that assist with managing thought, directing learning, and making connections (Stephens & Hermus, 2007). It is a great way to introduce an overall topic, increase student involvement, and get thoughts down quickly. Mind mapping is a skill that cuts across ability levels and encompasses all subject matters (Goldberg, 2004). Using the e-map technique (online concept/mind mapping online) gives instructors the freedom to express ideas and show interrelationships between concepts and content in a very visual and nonlinear structure that benefits their students (Ruffini, 2008). Mind mapping has considerable utility for tracking change in the course of learning, and has the capacity to distinguish between changes that are meaningful, and those that are not. Deep, surface and non-learning are tangible measures of learning that can be observed directly as a consequence of concept mapping (Hay, 2007).

A review of experimental and quasi-experimental studies by Nesbit & Adesope (2006), in which students learned by constructing, modifying, or viewing node-link diagrams showed that students in Grade 4 to the postsecondary level used concept maps

to learn science, psychology, statistics, and nursing. Across several instructional conditions, settings, and methodological features, the use of concept maps was associated with increased knowledge retention. In language learning, semantic mapping (a visual strategy for vocabulary expansion and extension of knowledge by displaying words in categories related to one another) was used effectively as a prereading, postreading, and prewriting activity with a group of students at the Marion County Adult Learning Center in West Virginia, all of whom read at less than the sixth-grade level (Ward, 1988). Rosenbaum (2001) also demonstrated how students who use background knowledge, context, morphology, and dictionaries, to learn words more effectively and adapted a vocabulary web consisting of eight identical bubbles to provide students with a word map, intertwining most of the elements to clarify word meaning as essential to vocabulary instruction. In second language contexts, Chularut and DeBacker (2004) investigated the effectiveness of concept mapping used as a learning strategy with students in English as a Second Language classrooms. Variables of interest were students' achievement when learning from English-language text, students' reported use of self-regulation strategies (self-monitoring and knowledge acquisition strategies), and students' self-efficacy for learning from English-language text. The findings showed a statistically significant interaction of time, method of instruction, and level of English proficiency for self-monitoring, self-efficacy, and achievement. For all four outcome variables, the concept mapping group showed significantly greater gains from pre-test to post-test than the individual study group. Findings of a study with secondary 1 and secondary 4 students revealed that the utilization of mind mapping in planning was a useful writing strategy that helped students improve their writing skills and enhance the writing quality (Chan, 2004). Results of another study that investigated bilingual knowledge maps (BiK-maps), as tools for learning German-English word pairs by 72 undergraduates indicated that BiK-map learners outperformed list learners on all dependent measures (Bahr & Dansereau, 2001). In vocabulary acquisition, a review of the literature showed that there is a great need for integrating mind-mapping techniques in the teaching of vocabulary to EFL students. Since EFL students in general and Saudi freshman students in particular, have difficulties learning English vocabulary, the present study demonstrates how mind-mapping software can be integrated in in-class vocabulary instruction as a brainstorming activity, and as a tool for helping the students organize, compare, group, connect, retain and review their vocabulary. Specifically, the present study shows how mind-mapping software can be used to help EFL freshman students learn, retain, apply and relate words sharing the same root or base, the same prefix or suffix, word cognates, derivatives of the same word, word synonyms and near-synonyms, words sharing the same spelling patterns (same silent letter, hidden sounds, double letters), and relate details which radiate out from the center. It will show how the mind-mapping software can be used to connect the printed form of the word with its pronunciation, part of speech, singular or plural forms, synonym or antonym, previously-encountered words and others.

2. CONTEXT OF THE STUDY

Female students majoring in translation at the College of Languages and Translation, King Saud University, Riyadh, Saudi Arabia, take intensive English language courses in semester 1-4 of the translation program, before taking specialized linguistics, translation and interpreting courses in semesters 5-10. Freshman students in their first semester of college take listening (3 hours per week), speaking (3 hours), reading (4 hours), writing (4 hours), vocabulary building (3 hours), and grammar (2 hours) courses in EFL. The students are all Saudi and are all native speakers of Arabic. Their median age is 18 years, with a range of 17-19. All of the students had 6 years of EFL instruction in grades 6-12.

At the beginning of the semester, freshman students enrolled in the Vocabulary I course were given a pre-test. Results of the vocabulary pretest showed that the students had several weaknesses such as: poor vocabulary knowledge, faulty pronunciation, inability to connect the pronunciation with the written form, relating words with their parts of speech, poor spelling, and inability to categorize words into groups sharing the same semantic feature and others. For students majoring in translation, vocabulary knowledge is an important element. By learning new words, students can increase their listening, speaking, reading and writing vocabularies and can improve comprehension and production in L2. Nassaji (2004) found that ESL students who have stronger depth of vocabulary knowledge make more effective use of certain types of lexical inferencing strategies than their weaker counterparts; and depth of vocabulary knowledge makes a significant contribution to inferential success over and above the contribution made by the learner's degree of strategy use. August, Carlo, Dressler & Snow (2005) also found that English language learners who experienced slow vocabulary development were less able to comprehend texts at the grade level than their English-only peers. Such students were likely to perform poorly on assessments in these areas and were at risk of being diagnosed as learning disabled.

3. CURRICULUM, TASKS AND MATERIALS

The textbook used in the freshman Vocabulary I course is *Vocabulary in Use: Pre-intermediate and Intermediate* (3rd Edition), by Stuart Redman (2003). The textbook consists of 100 lessons. Only 50 lessons were covered in class. The topics covered in class were: classroom language, prefixes, noun suffixes, adjective suffixes, nouns and verbs with the same form, compound nouns, compound adjectives, collocations, idioms and fixed expressions, verbs and adjectives followed by prepositions, preposition + noun, some functions, phrasal verbs (form, meaning, grammar and style), have and have got, make, do and take, give, keep, break, see, leave, catch and let, get (uses and expressions), go (uses and expressions), the senses, partitives, uncountable nouns and plural noun, the physical world, animals and insects, countries, nationalities and languages, the body and what it can do, around the home, the place where you live, money, physical injuries, clothes, food, cooking and restaurants, jobs, in the office, computers and the internet, and global problems.

3.1. Skills Emphasized

The vocabulary I course aims to develop freshman students' ability to do the following:

- Connect a word with its pronunciation
- Connect spoken phonemes with written graphemes: recognize silent letter, hidden consonants, double letters, words with the same vowel but different pronunciation and words with different vowels but same pronunciation, syllabication and stress
- Spell words correctly: recognize spelling changes and spelling variants
- Distinguish Parts of Speech
- Distinguish count/non-count
- Distinguish singular and plural forms
- Distinguish American vs. British usage
- Give word synonyms and antonyms
- Give English and Arabic meanings
- Word formation: prefixes, suffixes, derivatives and compounds
- Understand idioms and collocations
- Group words into families

3.2. In-class Instruction

Three to four vocabulary lessons are covered per week. The students do most of the vocabulary exercises in class. While doing the exercises, the author monitors their work and provides individual help. Only errors related to the rule or topic under study were highlighted. Feedback was provided on the presence and location of errors but no correct forms were provided. The students had to check the rules and examples in the book by themselves. Extra credit was given to students who could do all the items in an exercise correctly and within the designated time.

As for assessment, students are given two in-term tests and several pop-quizzes. The following skills are covered by the tests: recognizing silent letters, recognizing hidden consonants, recognizing double letters, recognizing words with the same vowel but different pronunciation, and words with different vowels but same pronunciation, identifying the part of speech, count/non-count, recognizing singular and plural forms, American vs. British usage, word synonyms and antonyms, adding prefixes, suffixes, recognizing derivatives and compounds, idioms and collocations, capitalization, giving the English definition, giving the Arabic meaning, and using words, idioms and phrasal verbs in sentences.

4. INSTRUCTIONAL STRATEGY WITH THE MIND-MAPPING SOFTWARE

A mind-mapping software called Free Mind 0.8.1 (www.freemind.com) was used as it is free. Free Mind allows the user to create mind-maps, i.e. diagrams or graphic organizers to visually organize information. A mind map consists of a main concept that the rest of the map revolves around. The main concept is placed in the center of a blank landscape page. From that main concept, branches that represent a single word, sub-category, detail or piece of information, related to the main concept, are created. Those radiate from the central concept as main branches with nodes for each. Lesser categories

are drawn as sub-branches that stem from the main branches to which further details such as images, words or parts of words that elaborate on the category or topic of the branch it stems from are added. Images, symbols, codes, or words can be used throughout the mind map. Keywords are printed using upper or lower case letters. Each word/image/detail sits alone on its own line (sub-branch). The lines (branches) become thinner as they radiate out from the center. The details, examples and details that radiate from each main branch can be enclosed in a cloud. Multiple colors can be used throughout the mind map for visual stimulation and for encoding or grouping.

In-class instruction with the mind-mapping software Free Mind goes through 6 stages: orientation, presentation and modeling, guided practice, independent practice, extension activities, and assessment. Each stage is explained in below.

4.1. Orientation

To help freshman students brain-storm, categorize, visualize and recall relationships among lexical items under study, mind mapping software Free Mind 0.8.1 can be integrated in in-class building vocabulary instruction. In the first week of classes, the students are introduced to the mind-mapping software and purposes of using it. They are given the link and are asked to download Free Mind 0.8.1 from the internet free of charge. The components of the Free Mind 0.8.1 homepage are introduced and explained.

4.2. Presentation and Modeling

The instructor can train students to use the Free Mind software using an LCD projector. Every week the software is used to create mind maps for the vocabulary items and vocabulary skills to be covered or those have been covered with the help of the instructor. The following types of mind maps can be created: (i) Morphological mind maps which focus on words sharing the same prefix, suffix, and forms derived from the same word. (ii) Sound-symbol association mind maps which focus on words spelled with the same vowel or vowel digraph but pronounced differently; words sharing the same vowel sound but spelled with different vowels or vowels digraph, words with silent letters, words with hidden sounds, homonyms, homophones, and so on. (iii) Syntactic mind maps which focus on singular and plural forms; word families, parts of speech, collocations, idioms, phrasal verbs and so on. (iv) Semantic mind maps which focus on synonyms and antonyms. (v) Variants which focus on American vs. British spelling and lexical variants.

A mind map begins with placing a target concept, skill or category in the middle of the screen. This concept or skill is used as a basis for grouping, categorizing and sub-categorizing vocabulary items. Branches radiating from the central category are drawn for the sub-categories. Sub-categories, examples and words are elicited from the students, grouped into related sub-categories and placed radiating out from the central category. The instructor introduces new words and related concepts attached to those known by the students. The four examples below, show how vocabulary mind-maps can be created for teaching prefixes and suffixes; singular and plural forms; pronunciation; and word families. Each mind-map is explained in detail below.

In Figure 1, the instructor places the target category 'prefixes and suffixes' in the middle of the screen. Branches and nodes are created for the adverb, verb, adjective, and negative prefixes and for noun suffixes. For each prefix or suffix under each category, a list of words is

prepared with the help of the students. Words containing each negative prefix or suffix expand outwards into branches and sub-branches. Examples containing those prefixes or suffixes expressed are selected and printed using upper or lower case letters. Each word sits alone on its own line. The lines are connected, starting from the central category as follows:

- (i) **Adverb suffixes:** *-ly* (quickly, mainly, separately, completely).
- (ii) **Verb suffixes:** (a) *-ize* (realize, specialize, civilize, socialize, globalize); (b) *-ate* (terminate, eliminate, separate, educate, graduate); (c) *-en* (broaden, widen, darken, soften, fasten, moisten).
- (iii) **Adjective suffixes:** (a) *-ive* (creative, productive, relative, selective); (b) *-y* (rainy, windy, cloudy, sunny, juicy); (c) *-ary* (elementary, primary, secondary); (d) *-al* (legal, electrical, global, usual, manual); (e) *-able* (suitable, electrical, global, usual, manual), (f) *-ous* (dangerous, precious joyous, prosperous); (g) *-less* (wireless, careless, homeless).
- (iv) **Negative prefixes:** (a) *im-* (impossible); (b) *in-* (incomplete, incredible); (c) *il-* (illegal, illogical, illegible); (d) *ir-* (irregular, irresponsible); (e) *un-* (uncomfortable, unhappy); (f) *dis-* (discontinue, disconnect); (g) *mis-* (misfit, misunderstand, misinterpret).
- (v) **Noun suffixes:** (a) *-ion* (decision, conclusion, comprehension, creation, education, selection, production); (b) *-ation* (communication, information, formation); (c) *-ment* (employment, development, government, improvement); (d) *-ance* (entrance, importance, significance); (e) *-ship* (friendship, hardship, relationship); (f) *-an* (electrician, European, American); *-hood* (motherhood, fatherhood, childhood, neighborhood); (g) *-er* (reader, writer, speaker, maker); *-ist* (dentist, scientist, biologist, geologist, terrorist); (f) *-ness* (happiness, kindness, shortness).

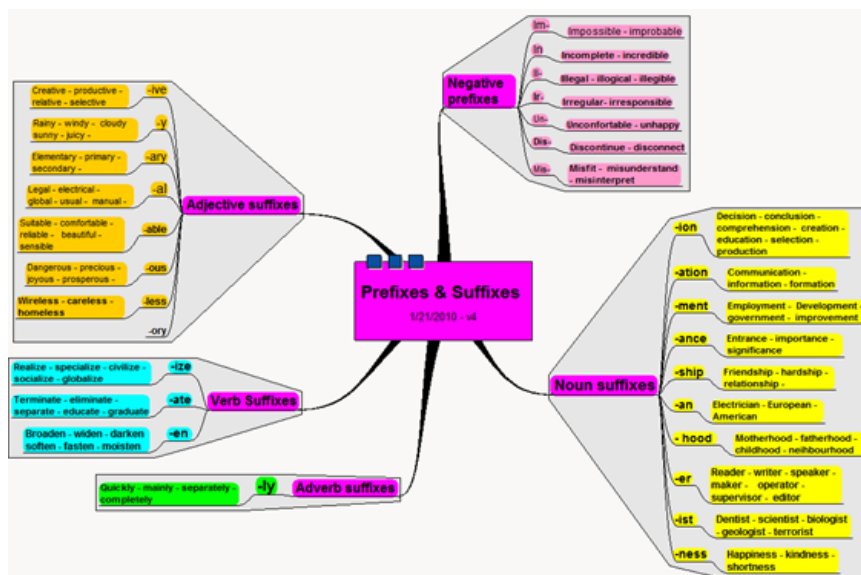


Fig. 1 Mind-Map for Teaching Prefixes and Suffixes

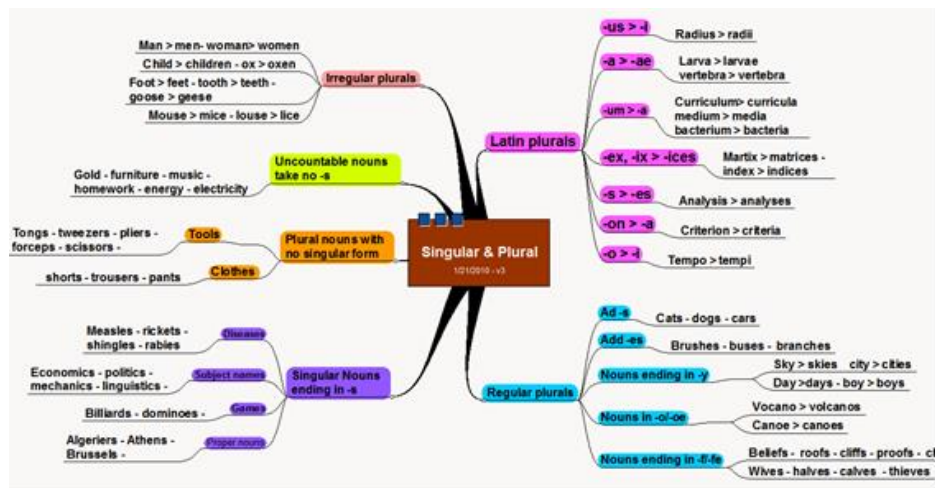


Fig. 2 Mind-Map for Teaching Singular and Plural Forms

In Figure 2, the central focus is singular and plural forms. Each of the main branches represents one case of plural formation as follows: (i) regular plurals, (ii) irregular plurals, (iii) uncountable nouns that take no *-s*; (iv) plural nouns with no singular form; (v) singular nouns ending in *-s*; and (vi) Latin plurals. The examples that radiate from each main branch are examples of each case. Sub-branches radiating from each main branch are as follows:

- (i) The regular plurals main branch shows the following sub-categories: (a) regular plurals ending in *-s* and *-es*, (b) nouns ending in *-y*; (c) nouns ending in *-o*; (d) nouns ending in *f*.
- (ii) The 4 sub-branches radiating from the *irregular plurals* branch show 4 types of irregular nouns: (a) *man, men*; (b) *child, children; ox, oxen*; (c) *foot, feet; tooth, teeth; goose, geese*; (d) *mouse, mice; louse, lice*.
- (iii) Several examples radiate from the *uncountable nouns that take no -s* such as *gold, furniture, music, homework, energy, electricity*.
- (iv) Two sub-branches radiate from the main branch representing *plural nouns with no singular nouns*: (a) plurals showing tools such as *tongs, tweezers, pliers, forceps* and *scissors*; (b) plurals showing clothes such as *pants, trousers, and shorts*.
- (v) Several sub-branches radiate from the main branch for *singular nouns ending in -s*: (a) diseases: *measles, rickets, shingles, rabies*; (b) subjects: *economics, politics, mechanics, linguistics*; (c) games: *billiards, dominoes*; (d) countries and cities: *Algiers, Athens, Brussels*.
- (vi) Several sub-branches with examples radiate from the *Latin plurals* main branch that show examples of singular word endings and their plural counterparts such as: (a) the Latin ending *-us* changes to *-i* as in *radius, radii*; (b) *-a* changes to *-ae* as in *larva, larvae; vertebra, vertebrae*; (c) *-um* changes to *-a* as in: *curriculum, curricula; medium, media; bacterium, bacteria*; (d) *-ex* and *-ix* change to *-ices* as in: *matrix,*

matrices; *index, indices*; (e) *-s* changes to *-es* as in: *analysis, analyses*; (f) *-on* changes to *-a* as in *criterion, criteria*; (g) *-o* changes to *-i* as in *tempo, tempi*.

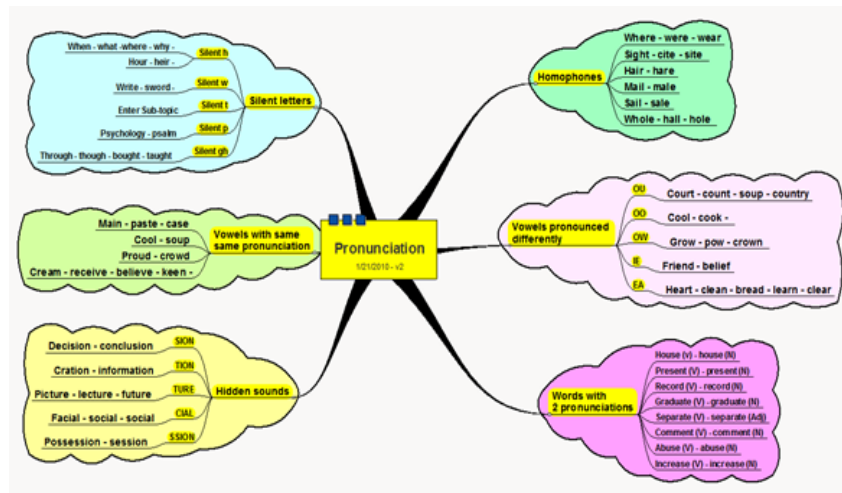


Fig. 3 Mind-Map for Teaching Pronunciation

In Figure 3, a mind-map for teaching pronunciation is shown. Six main branches radiate from the center pronunciation, each of which focuses on one pronunciation (phonics) rule: (i) words with hidden sounds; (ii) vowels that have the same pronunciation; (iii) words that have silent letter; (iv) words that are homophones; (v) those with vowel digraphs that are pronounced differently; and (vi) words with two pronunciations. Sub-branches that radiate from each main branch show examples and/or cases of each rule as follows:

- (i) words with hidden sounds: (a) **-sion** as in *decision, conclusion*; (b) **-tion** as in *creation, information*; (c) **-ture** as in *picture, lecture, future*; (d) **-cial** as in *facial, social*; (e) **-ssion** as in *possession, session*.
- (ii) vowels that have the same pronunciation such as: (a) *main, paste, case*; (b) *cool, soup*; (c) *proud, crowd*; (d) *cream, receive, believe, keen*.
- (iii) words that have silent letter such as: (a) words with **silent h**: *when, what, where, why*; (b) words with **silent w** as in *write, sword*; (c) words with **silent t** as in *listen*; (d) words with **silent p** as in *psychology, psalm*; (e) words with **silent gh** as in *through, though, bought, taught*.
- (iv) words that are homophones such as: (a) *where, were, wear*; (b) *sight, cite, site*; (c) *hair, hare*; (d) *mail, male*; (e) *sail, sale*; (f) *whole, hall, hole*.
- (v) words with vowel digraphs that are pronounced differently such as: (a) **"ou"** as in *court, count, soup, country*; (b) **"oo"** as in *cool, cook*; (c) **"ow"** as in *grow, pow, crown*; (d) **"ie"** as in *friend, belief*; (e) **"ea"** as in *hear, clean, bread, learn, clear*.

Words with two pronunciations and two parts of speech as in the following examples: (a) house (N & V); (b) present (N & V); (c) record (N & V); (d) graduate (N, V); (e) separate (V, Adj); (f) comment (N & V); (g) abuse (N & V); (h) increase (N & V).

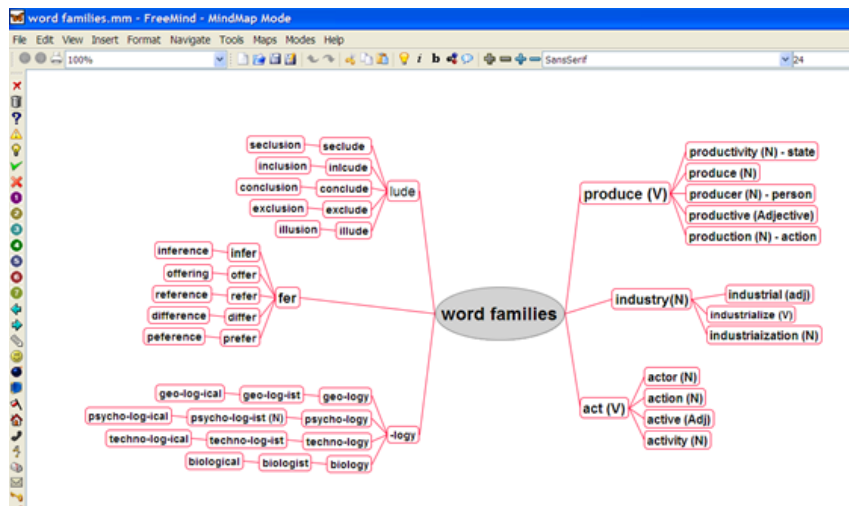


Figure 4: Mind-Map for Teaching Word Families

Figure 4 shows a mind-map for teaching word families. This mind-map consists of the center Word Families, with 6 main branches radiating from the center, each of which showing an example of word formation such as: (i) words derived from a verb (2 branches); (ii) words derived from a noun; (iii) verbs that share the same root with nouns derived from each (2 branches); (iv) and nouns ending with the same suffix with other forms derived from each (1 branch). Several sub-branches radiate from each of the main branches. Those give illustrative examples of each word formation process as follows:

- (i) forms derived from the verb **act**: *actor* (N), *action* (N), *active* (Adj), *activity* (N).
- (ii) forms derived from the verb **produce** such as *productivity* (N), *produce* (N), *producer* (N), *productivity* (N), *productive* (Adj).
- (iii) Those derived from a noun such as **industry**: *industrial* (Adj), *industrialize* (V), *industrialization* (N).
- (iv) verbs that share the root **-fer** (*infer*, *offer*, *refer*, *differ*, *prefer*) with nouns derived from each (*inference*, *offering*, *reference*, *difference*, *preference*).
- (v) verbs that share the root **-lude** (*seclude*, *include*, *conclude*, *exclude*, *elude*) and nouns derived from them (*seclusion*, *inclusion*, *conclusion*, *exclusion*, *elusion*).
- (vi) nouns ending with the suffix **-logy** referring to the discipline (*geology*, *psychology*, *technology*, *biology*), nouns referring to the person (*geologist*, *psychologist*, *technologist*, *biologist*), and adjectives (*geological*, *psychological*, *technological*, *biological*) derived from each. More branches and sub-branches that show further examples roots, prefixes and/or suffixes can be added.

Mind-maps for other vocabulary sub skills such as homonyms, homophones and homographs, types of nouns, idioms and collocations, American and British variants, synonyms and antonyms, words related to certain themes such as professions, clothes, food, body parts can be created in the same way. Colors can be used throughout the mind map. Associations are shown in the mind map. The mind map is kept clear by using a radiant hierarchy, numerical order or outlines to embrace branches. The central lines are made thicker, organic and flowing, becoming thinner as they radiate out from the center.

The students develop their own personal style of mind mapping. They draw empty lines, collect the words they have studied and classify them. They change colors to reenergize their mind. Sometimes the students are able to see relationships and connections immediately and can add sub-branches to a category. Sometimes they cannot, so they can just connect the subcategories to the central focus. Organization always comes later; the first requirement is to get few words and categories out of their head and onto the screen. During the mind mapping activity, the instructor serves as a facilitator. She provides technical support, answers students' questions and helps with the mind maps, categories, examples representing each category in and out of class.

4.3. Guided Practice

Students practice connecting new vocabulary items studied in class with vocabulary items they already know using Free Mind 0.8.1. out of class. They keep their phonic, morphological, syntactic, and semantic mind maps and continue to add sub-categories and words to each map, every time a lesson is covered in class. With the help of the instructor, the students make word lists and add words related to each phonic, morphological, syntactic, or semantic mind map. New features, categories, skills are explored through discussion.

4.4. Independent Practice

The students continue to use Free Mind at home and continue to add words related to each. They are handed out questions that require them to group, classify or connect vocabulary items studied in class, on their own, in class or at home. Mind maps can be created and added during, and after reading.

4.5. Extension Activities

The students use Free Mind to group, classify or connect vocabulary items encountered in a reading text on the basis of decoding, phonological, morphological, and semantic relationships. The students can create those mind-maps individually, in pairs or small groups. They can exchange their mind-maps, keep them in a folder or e-portfolio, and/or post them in an online course.

4.6. Assessment

The students are given blank mind-maps and are asked to group, classify, and connect a set of words according to phonological, morphological and semantic relationships. At an advanced stage, they are given a set of words and are requested to draw a mind-map

from scratch using the Free Mind software to show certain phonological, morphological and/or semantic relationships.

5. EFFECT OF USING VOCABULARY MIND-MAPS ON VOCABULARY ACQUISITION

The author used vocabulary mind-maps with several groups of EFL freshman students. Comparisons of vocabulary pre and posttest scores of students who used vocabulary mind-maps as a supplement to in-class vocabulary instruction based on the textbook with the pre and posttest scores of students who received vocabulary instruction based on the textbook only, showed significant differences in vocabulary acquisition as revealed by the posttest. Students who used vocabulary mind-maps showed higher gains in vocabulary acquisition and more accuracy in vocabulary knowledge.

6. CONCLUSION

The present study shows how the Free Mind 0.8.1 software can be used in grouping, categorizing, and classifying lexical items on the basis of morphological, syntactic, phonic or semantic concepts. Those mind maps can be used in introducing, categorizing, visualizing and reviewing vocabulary and as mnemonic devices. Through a graphic depiction of words, these mind maps build upon what students know to help them see relationships with newly introduced vocabulary. Students develop related rather than isolated word knowledge and develop skills in differentiating concepts as well as defining words. These mind mapping strategies have been reported to improve word and concept knowledge, as well as comprehension across grade levels, in a variety of content areas, and with a variety of learners, including struggling ESL, bilingual, and learning disabled readers. Semantic mapping increases cognitive processing, and develops the cognitive structure. Semantic mapping that involves the application of vocabulary meanings with literacy students in adult learning centers. Semantic mapping is highly motivating for adult students because it allows them to interact with teachers regarding the context of the lesson, rather than merely focus on a specific point of skill development. The ultimate goal of semantic mapping is to introduce the students to a technique that they can use regularly to organize what they have learnt, relate this content to what they already know, and expand their store of knowledge (Ward, 1988).

It is noteworthy to say that the aim of the mind mapping vocabulary activity is not to teach the students how to apply the details of the Free Mind software and how to use it in studying vocabulary and other skills. Focus should be on placing the morphological, semantic, syntactic, phonics, phonological categories that would be used as a basis for grouping and classifying words in the center, how to add branches for the details, how to add pictures and change the font color, size and case.

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