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# The comparative effect of concept mapping and vocabulary notebook keeping on Iranian EFL learners' self-regulation in vocabulary learning

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**Abstract:** The important role of vocabulary has long been established in second language acquisition, and many theories have been proposed for vocabulary teaching and learning. The current study aimed to investigate the effects of concept mapping and notebook keeping on self-regulation in vocabulary learning. To this aim, 90 female language learners in three intact classes were selected based on convenience sampling as the participants of the study and were given a pretest and posttest of self-regulation in vocabulary. One of the groups was given concept maps while another group received notebook keeping materials as treatment and the last one served as the control group. The collected data were analyzed through running One-Way ANOVA. The results of the analysis revealed that both concept mapping and notebook keeping significantly enhanced self-regulation in vocabulary learning among Iranian EFL learners. Moreover, no significant difference was found between concept mapping and notebook keeping in terms of their effects on self-regulation in vocabulary acquisition. Based on the findings, EFL teachers may intend to encourage learners to employ concept mapping and notebook keeping techniques

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## ABOUT THE AUTHOR

Aliasghar Naderifar received his B.Sc. in textile engineering from Guilan University. He also holds an MA degree in TEFL from Qazvin Islamic Azad University. He is an English instructor in Cultural Centers. His pivotal study interests concern "Second Language Learning and Teaching", "Vocabulary Acquisition", "Pragmatics", and "Education Research". His latest publication is an article entitled "The Relationships between Iranian Intermediate EFL Learners' Willingness to Communicate, Oral Proficiency, Autonomy, and Ambiguity Tolerance".

## PUBLIC INTEREST STATEMENT

Undoubtedly, vocabulary is the most essential element in language learning and pedagogy. To assist learners in vocabulary acquisition, researchers and teachers believe vocabulary-learning strategies can help learners improve their language skills. Two of these strategies are concept mapping and notebook keeping. In concept mapping, learners draw a map and put the vocabulary items related to a concept in. As for notebook keeping, learners keep a notebook to jot down their vocabulary items. Therefore, the current study investigated the impacts of concept mapping and notebook keeping on Iranian EFL learners' self-regulation in vocabulary learning. This perspective study found that both concept mapping and notebook keeping significantly enhanced self-regulation in vocabulary learning among Iranian EFL learners. Moreover, no significant difference was found between concept mapping and notebook keeping in terms of their effects on self-regulation in vocabulary acquisition. Such findings suggest implications for EFL teachers, material developers and designers, teacher trainers, and practitioners.

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not only as effective vocabulary learning strategies but also as vehicles for self-regulation growth in vocabulary acquisition.

**Subjects: Language & Linguistics; Language Teaching & Learning; Literature**

**Keywords: concept mapping; notebook keeping; self-regulation; vocabulary learning**

## 1. Introduction

The significant role of vocabulary in language learning cannot be underestimated. A review of the present empirical studies on vocabulary (e.g., Agustín-Llach, 2015; Alipour Madarsara, Youhanaee, & Barati, 2015; Arast & Gorjian, 2016; Ertürk, 2016; Ghanbari & Marzban, 2014) is a verification for the fact that vocabulary is considered the most essential component in language learning. Therefore, if language learners intend to enhance their learning, they should be able to use strategies. Language Learning Strategies (LLS) are the activities, which language learners do consciously in order to improve their learning (Anderson, 2005). Schmitt (2010) argued that when an activity is precisely suitable for an individual learner, it becomes strategic. Self-regulation is one of the strategies that language learners can use to improve language learning.

Self-regulation is represented as the degree to which learners are involved in the process of learning and achieving their objectives (Zimmerman, 2000). This involves motivational, behavioral, and cognitive engagement. Self-regulation is defined by Wolters (2003) as a process of connecting, monitoring, managing, control of perception, motivation, behavior, and setting in order to accomplish self-set objectives (as cited in Yigzaw & Fentie, 2013). The question is how self-regulation can be boosted for the purpose of vocabulary learning. In other words, which instructional techniques can enhance self-regulation among language learners? Definitions of self-regulation imply that techniques and strategies that impel the learners to systematically and objectively monitor their progress and accordingly revise their learning efforts could enhance the self-regulation. In the realm of vocabulary learning, concept-mapping and notebook keeping are two learning strategies through which learners can monitor their progress and consequently expand their vocabulary knowledge.

Concept mapping (CM) is one of the teaching techniques, which can probably influence self-regulation. Concept mapping is a strategy, which can be employed in different domains (Novak, 1998). It is considered a visual instrument that covers the most important notions at the top in a hierarchical order. Through linking concepts together, students are able to understand the concepts better. Hay and Kinchin (2006) defined concept mapping as a graphic organizational method designed in order to help individuals and groups to describe and discover their knowledge, and understand the topic. Results of Mackinnon's (2006) study indicated a positive effect of CM on students' capabilities in expressing arguments, leading effective negotiations, and verifying the theoretical contexts.

Another way that can be used to improve an individual's vocabulary is to have learners keep vocabulary notebooks. According to Fowle (2002), with the latest emphasis of applied linguistics on lexical competence, and its effect on language teaching, many language teachers are now conscious of the requisite of making vocabulary as a dominant part of their teaching practice. Regarding Kim (2009), there are a number of studies about the mental lexicon. Accordingly, as supported by Lewis (2002), Lewis (2008)), lexical approaches have been at the center of attention in language learning and teaching. According to Rumelhart and McClelland (1986), as vocabulary notebooks have been extensively used for lexical learning, the results on the mental lexicon suggest that a learning instrument can be created to measure lexical knowledge, using connectionist features in learning and use.

In light of the aforementioned findings, it can be concluded that previous studies have not examined the impact of concept mapping and notebook keeping on the enhancement of self-

regulation in vocabulary learning. Therefore, this study aimed to investigate the effect of concept mapping on Iranian EFL learners' self-regulation in vocabulary learning. Moreover, the study sought to probe the effect of note-book keeping on Iranian EFL learners' self-regulation in vocabulary learning. Finally, the study aimed to find any significant difference between concept mapping and vocabulary notebook keeping in terms of their effects on Iranian EFL learners' self-regulation in vocabulary learning.

### *1.1. Research questions*

(1) Does concept mapping have any significant effect on Iranian EFL learners' self-regulation capacity on vocabulary learning?

(2) Does vocabulary notebook keeping have any significant effect on Iranian EFL learners' self-regulation capacity in vocabulary learning?

(3) Is there any significant difference between concept mapping and vocabulary notebook keeping in terms of their effects on Iranian EFL learners' self-regulation in vocabulary learning?

## 2. Literature review

### *2.1. Concept mapping*

According to Novak (1998), Concept mapping is considered an innovative note-taking method, which helps us to recall much information. The colorful concept map is the best one, which uses more pictures and symbols usually similar to an art. Concept mapping is an influential graphic method, which provides a universal key to reveal the capacity of brain (Novak, 1998). Concept mapping technique is likely to enhance the thinking processes, making it possible for a person to move from one topic to another, and record the information by means of signs, images, emotional meaning, and colors, the same way as brain processes it. A pattern containing image, sign, and color will not only help learners to understand vocabulary, but also makes the students feel pleasant and excited which finally leads them to be interested in vocabulary knowledge learning (Novak, 1998).

According to Hay and Kinchin (2006), concept mapping is a powerful graphic method, which offers a common key to reveal the capability of the brain. Concept mapping is a visual map of notions, put in a circular format around a central notion which includes a unique blending of pictures, color and visual-spatial organization, developed to meaningfully reflect the interrelationships among the concepts in the map (Horton, 1993). Concept maps draw on connotations to trigger the brain in the process of recalling the content included in the map. Mackinnon (2006) notes that concept mapping is the use of whole brain method by means of visualization and other graphic organization to succeed. In addition, concept mapping is one of the techniques through which students can enjoy learning more vocabulary.

Some scholars such as Horton (1993) believe that a concept map symbolizes a person's knowledge structure visually on a precise issue. Besides, other explanations of concept mapping describe it as a type of two-dimensional, hierarchical, node-linked figures, signifying the person's ideational or declarative knowledge in the form of a clear graphic diagram. Abrams (2007) declared that this map provides the individual with an opportunity to gain a general impression of the learners' understanding of the key model.

### *2.2. Vocabulary notebook keeping*

A vocabulary notebook is a learning instrument that learners record components that expand the learning of new and beneficial vocabulary items. Using a vocabulary notebook in the classroom is a relatively new concept and even in the basic form of recording an item, the vocabulary notebook is helpful to the learner (Kim, 2009). McCarthy (1990 as cited in Kim, 2009) claims that writing a word down is useful in fixing it in the memory. A regular vocabulary notebook format consists of the

form of the L2 items together with L1 equivalents and sample sentences; L2 descriptions are considered optional (McCrostie, 2007).

While some vocabulary notebooks may contain some other features of lexical knowledge, as shown in Fowle (2002), they were brought up only as means of exposing the students to different methods of recording vocabulary. As Chien (2013) maintains, keeping a vocabulary notebook is a cognitive strategy within the greater categories of consolidation strategies. Chien focused on non-English major freshmen's view and practice of the vocabulary notebook as their vocabulary learning strategy. The learners in this study had a positive attitude toward vocabulary notebooks since vocabulary notebooks helped them learn English words and develop their word knowledge, mainly, of word families.

Bozkurt (2007) examined the efficiency of vocabulary notebooks on vocabulary achievement and the attitude of both teachers and learners towards keeping vocabulary notebooks. Receptive and productive vocabulary tests, free vocabulary use compositions, group interviews with the students, and one-to-one interview with the teacher were the instruments of the study. Based on the data analyses, vocabulary notebooks are appropriate for vocabulary achievement. Moreover, both students and their teachers indicated the positive attitudes toward vocabulary notebooks. Bozkurt noted that vocabulary notebooks help learners to have more frequent exposures to vocabulary.

The results of some other studies suggest that this method develops the individual's motivation and presentation, providing him or her with the information and skills in order to carry on learning autonomously. For instance, Fowle (2002) reviewed the influence of vocabulary notebooks on vocabulary learning. The findings demonstrated a significant effect of notebooks on the achievement of lexical competence, increasing the use of different cognitive techniques and helping learners have a chance for self-management strategies development, and leading to autonomy.

### *2.3. Self-regulation in vocabulary learning*

Pintrich (2000) defined self-regulation as an active, useful process during which learners set objectives for their learning and try to monitor, control, and adjust their perception, behavior, and motivation, which are constrained and guided by their objectives and relative characteristics of the setting. Pintrich believes that self-regulation-based learning is a process, which helps students control and manage their thinking procedures, feelings, and behaviors in order to experience their learning skills positively.

Kozlowski and Bell (2006) in their study investigated unified and independent effects of attainment and goal setting orientation views on the extent of learners' self-regulation activity. The findings showed goal content, goal proximity activities, and goal frame had an important effect on self-regulation.

Yesilbursab and Bilicana (2013) examined the attitudes of high school EFL groups of students toward strategies of language learning especially vocabulary, exploring if a one-month-period self-regulated vocabulary learning and consciousness-raising program can affect the use of vocabulary learning strategies and the degree of success among the learners. The findings of the study showed that consciousness-raising had no significant effect on the self-regulated ability for vocabulary learning.

Amirian, Mallahi, and Zaghi (2015) investigated the relationship between Iranian EFL students' self-regulation vocabulary learning and vocabulary size. The results of the study showed that those learners who achieved higher scores on the vocabulary test also had higher scores on the self-regulated capacity vocabulary questionnaire used in the study.

## 3. Method

### *3.1. Participants*

The study was done on a sample of 90 female Iranian EFL learners in their intact classes in Safir language institute in Tehran. They were all female learners because language schools in Iran have

a single-sex policy classes and at the time of data gathering only female students were available. Participants of the study were learning English at the intermediate level of language proficiency in six separate classes. There were two classes of 15 students; one class contained 10 students, another class was composed of 8 students and one more class comprised 12 students. There were also two other classes one containing 13 the other 17 students. The two classes with 15 students in each one (totally 30 students) were chosen to serve as the concept mapping group and the rest served as the notebook keeping group. The classes with 13 and 17 learners served as the control group. The concept mapping group received instruction on concept mapping for learning vocabulary and notebook keeping group kept notebooks for learning vocabulary items. Before starting the experiment, the Test of English as a Foreign Language (TOEFL) was administered to the groups and the test scores of the groups were analyzed to make sure they were homogeneous in terms of overall language proficiency.

### *3.2. Instruments*

In this study, one dependent variable needed to be measured, i.e. self-regulation capacity in vocabulary learning. In addition, language proficiency of the students needed to be assessed before experimentation and it was measured using TOEFL. The scale for measuring self-regulation capacity in vocabulary learning and language proficiency is described below.

#### *3.2.1. Self-regulation scale of vocabulary acquisition*

Tseng, Dörnyei, and Schmitt (2006) developed the self-regulation scale of vocabulary acquisition (Appendix A) for measuring five aspects of self-regulation in vocabulary acquisition encompassing commitment, metacognition, satiation, emotion, and environment. The scale was designed drawing on the self-regulation construct proposed by Dornyei (2001) and included 20 items. Each item could be answered by choosing one of the options strongly disagree (1) to strongly agree (6) leading to a score of 1 to 6 for each item and a score of 20 to 120 for the whole scale. As for the reliability of the scale, it was piloted before using in the main study and a reliability index of 0.78 was found after running Cronbach's Alpha.

#### *3.2.2. Test of English as a foreign language (TOEFL)*

TOEFL measures all language skills but for the purpose of the current study, which had a small-scale impact, two subtests, i.e. structure/written expression and reading sections, were used to ensure about proficiency level of participants. The two sections of the TOEFL used in the study contained 90 items and were taken from TOEFL original samples. The structure/written section evaluates the test takers' ability in using grammar and appropriately for standard written English. This section covers 40 multiple-choice questions and needs to be completed in 20 minutes. The reading section comprises non-technical passages and test takers must answer 50 multiple questions in 55 minutes. The reading comprehension questions check test takers' understanding of stated and implied information and meaning of specific words and phrases. Language proficiency of the students was assessed to establish that the groups of the study were homogeneous in terms of language proficiency.

### *3.3. Procedure*

One well-known language school was identified and the manager of the school was briefed on the research project and its purposes. The manager was assured that all names including the name of the institute would remain confidential and she would be the first person to know about the results of the study and would be consulted before publishing the results. With the cooperation of the language school, a list of intermediate classes was provided and an initial arrangement was made to attend the classes for the preliminary analysis and preparations for conducting the research. The students remained in their classes and were tested for language proficiency. To this end, they took the TOEFL. After making sure about the homogeneity of the participants in terms of overall language proficiency, self-regulation survey was given to the participants. The initial assessment indicated that all the groups (concept mapping group, note keeping group, and control group) were

homogeneous in terms of their capacity to self-regulate themselves for vocabulary acquisition and also in terms of overall language proficiency.

In concept mapping group, students were instructed to create concept maps of new and previous vocabulary items they encounter during their class hours. Drawing on Novak and Gowin's (1984) study in an introductory session, students were trained what concept map was and how to create and use the concept maps. They became familiarized with the elements of concept mapping and were instructed that concept mapping is based on a central theme or topic and then topics are narrowed down to reach the simple words and notions. An example of a concept map was presented to students (Appendix B) and students were made to practice creating a concept map using the words given by the instructor. In the following sessions, students needed to create one or several concept maps based on themes and words presented in each session. Their concept maps were randomly checked in each session to make sure they were on the right track. Students were also told to keep a record of their maps in order to be a good source for reviewing new words, particularly for exam preparation. The treatment lasted for ten sessions. An example of concept mapping technique is demonstrated in Figure 1.

In notebook keeping group, students received the same language lessons except that instead of creating concept maps they were instructed to keep a notebook of new words. The elements of notebook keeping for the purpose of learning words were based on Schmitt and Schmitt (1995). Accordingly, students were asked to have a notebook with adequate space for word entries. In each entry, students needed to write the new words along with their L1 equivalents and in case they knew the synonyms they could provide the synonym or both depending on students' preferences. Moreover, they were instructed to use the collocations and the surrounding words of the target words. In each session, some notebooks of students were randomly examined to check students' compliance and to make sure they are on the right track in terms of notebook keeping. It should be noted that each session the word entries related to previous sessions were checked. An example of the notebook-keeping technique is shown in Figure 2.

The control group did not receive any of the concept mapping and notebook keeping procedures. They just followed the routing instructional practice of their classes. With respect to vocabulary practice, students in the control group just practiced memorization and use of new words in sentences.

It should be noted that both concept mapping and notebook keeping groups followed the regular lessons scheduled by the language school and the only intervention was that participants

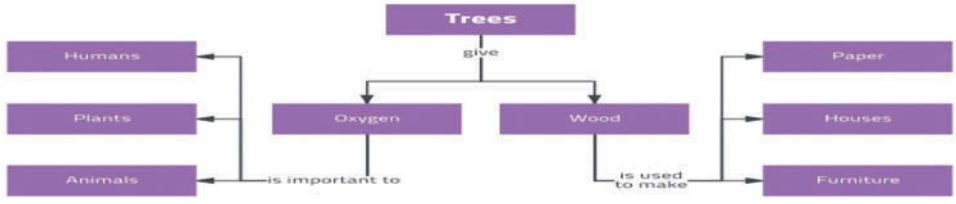


**Figure 1. A sample of concept mapping strategy.**

| Words or Concepts | L1 Equivalents | Synonyms | Antonyms | L2 Descriptions |
|---|---|---|---|---|
| Gain (V.) | به دست آوردن، گرفتن | Obtain, Acquire | Lose, Miss | To achieve something you want or need |
| Firm (Adj.) | استوار، راسخ | Solid, Hard | Soft, Fragile | Not yielding or soft to pressure |
| Prodigy (N.) | اعجوبه، غیرعادی | Genius, Intellect | Amateur, Idiot | A person Who has a great natural ability |

**Figure 2. A sample of notebook-keeping strategy.**

needed to keep the record of new vocabularies through either concept mapping or notebook keeping. Both groups were also encouraged to review their notebooks or concept maps for exams and quizzes. Regularly, teachers needed to give small quizzes three or four times during the term and there was also a final exam at the end of the course.

As the final step of the treatment, students in the three groups were asked to complete the self-regulation questionnaire again after the final exam. The questionnaires were rated by giving a score of 1 to 6 to each item. The collected data (before and after treatment) were analyzed using IBM SPSS STATISTICS (version 21) and using statistical technique of One-Way ANOVA.

## 4. Results

The current study explored the impact of concept mapping and notebook keeping on Iranian EFL learners' self-regulation in vocabulary learning. Table 1 shows the learners' self-regulation capacity results before and after treatment.

### *4.1. Descriptive statistics*

The information on the main variables of this study is shown in Table 1 including mean values, standard deviations, and Kolmogorov-Smirnov values.

An overview of the descriptive statistics of self-regulation clearly demonstrates that both concept mapping and notebook keeping groups had almost similar self-regulated mean scores before and after the treatment. For instance, in pretest, concept mapping group mean score is 65.83 (SD = 6.99), for notebook keeping group is 66.16 (SD = 6.67), and for control group 66.86 (SD = 6.56). Similarly, concept map group mean score is 78.53 (SD = 3.72), for notebook keeping group is 77.93 (SD = 4.41) and for control group 68.00 (SD = 3.32) in posttest. Some conclusions seem warranted according to the results that were further examined through addition statistical analysis. For further investigation, One-Way ANOVA was run on the self-regulation pretest and posttest of the three groups, i.e. concept map, notebook, and control groups. The use of One-Way ANOVA was statistically feasible because all the pretest and posttest scores were normally distributed in groups according to the results of Kolmogorov-Smirnov test of normality ($p > 0.05$).

### *4.2. Investigation of research questions*

#### *4.2.1. Investigation of the first research question*

The first research question of the present research was concerned with whether concept mapping had any significant effect on Iranian EFL learners' self-regulation in vocabulary learning. Using IBM SPSS, ANOVA was run on pretest and posttest of the groups for finding the answer to the research questions. Table 2 presents the results.

As seen in Table 2, there were no significant differences between the groups in self-regulation pretest ($F_{(2, 87)} = 0.182$, $p > 0.05$). In other words, no significant difference was found between the control group and concept map group. However, in posttest, a significant difference was found between the groups ($F_{(2, 87)} = 70.95$, $p \leq 0.05$). To detect the effect of concept mapping on the self-regulation of learners, *post hoc* test of Tukey was checked between the control group and concept-mapping group. Table 3 shows the results of *post hoc* test of Tukey on self-regulation posttest between the groups.

Based on the results of test of Tukey, a significant difference was found between the control group and concept mapping group ($p \leq 0.05$). As seen in Table 3, the mean difference is negative which points to a lower score of students in control group. By considering the fact that no significant difference was found between all the groups in self-regulation pretest, it can be concluded that concept mapping had a significant effect on the self-regulation capacity of the learners.

**Table 1. Learners' descriptive statistics of self-regulation before and after the treatment**

| | Groups | N | Mean | Std. Deviation | Std. Error Mean | Kolmogorov-Smirnov | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Statistic | df | Sig. |
| Self-regulation pretest | Concept map | 30 | 65.8333 | 6.99795 | 1.27764 | .119 | 29 | .200* |
| | Notebook | 30 | 66.1667 | 6.76748 | 1.23557 | .108 | 29 | .200* |
| | Control | 30 | 66.8667 | 6.56392 | 1.19840 | .092 | 30 | .200* |
| self-regulation posttest | Concept map | 30 | 78.5333 | 3.72071 | .67931 | .150 | 29 | .083 |
| | Notebook | 30 | 77.9333 | 4.41731 | .80649 | .127 | 29 | .200* |
| | Control | 30 | 68.0000 | 3.32182 | .60648 | .082 | 30 | .200* |

**Table 2. One-way ANOVA results on the pretest and posttest scores of groups**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Self-regulation pretest | Between Groups | 16.689 | 2 | 8.344 | .182 | .834 |
| | Within Groups | 3997.800 | 87 | 45.952 | | |
| | Total | 4014.489 | 89 | | | |
| self-regulation posttest | Between Groups | 2099.822 | 2 | 1049.911 | 70.955 | .000 |
| | Within Groups | 1287.333 | 87 | 14.797 | | |
| | Total | 3387.156 | 89 | | | |

**Table 3. The result of *post hoc* test of Tukey on self-regulation posttest between the groups**

| Dependent Variable | (I) Groups | (J) Groups | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| self-regulation posttest | Concept map | Notebook | .60000 | .99321 | .818 | −1.7683 | 2.9683 |
| | | Control | 10.53333* | .99321 | .000 | 8.1650 | 12.9016 |
| | Control | Concept map | −10.53333* | .99321 | .000 | −12.9016 | −8.1650 |
| | | Notebook | −9.93333* | .99321 | .000 | −12.3016 | −7.5650 |

#### *4.2.2. Investigation of the second research question*

The second research question of the present research was concerned with whether vocabulary notebook keeping had any significant effect on Iranian EFL learners' self-regulation in vocabulary learning. The answer to this question was sought by consulting the One-Way ANOVA and *post hoc* test of Tukey in Tables 2 and 3 respectively. Based on the result of One-Way ANOVA (Table 2), no significant differences existed between the groups in self-regulation pretest ($F_{(2, 87)} = 0.182$, $p > 0.05$) which indicates that control group and notebook keeping group had equal performance in self-regulation pretest. However, in posttest, *post hoc* test of Tukey showed a significant difference between control group and notebook keeping group ($p \leq 0.05$). The mean difference was negative which points to a lower score of students in control group (Table3). Therefore, the result of comparison between the control group and notebook keeping group showed the significant effect of notebook keeping on self-regulation capacity of the learners.

#### *4.2.3. Investigation of the third research question*

The third research question of the present research was concerned with whether there was any significant difference between concept mapping and vocabulary notebook keeping in terms of their effects on Iranian EFL learners' self-regulation in vocabulary learning. As it was mentioned earlier (section 4.2.1 and 4.2.2) no significant difference was found between the groups in self-regulation pretest ($F_{(2, 87)} = 0.182$, $p > 0.05$) which means that both concept mapping and notebook keeping groups had equal performance in self-regulation before treatment. However, after treatment, a significant difference was found between the groups ($F_{(2, 87)} = 70.95$, $p \leq 0.05$). After checking the result of *post hoc* test of Tukey no significant difference was found between the concept mapping and notebook keeping groups in posttest of self-regulation ($p > 0.05$) which indicates that no significant difference existed between the effects of concept mapping and notebook keeping.

## 5. Discussion

Based on the results of analyses, it was revealed that both concept mapping and notebook keeping significantly enhanced self-regulated capacity in vocabulary acquisition of Iranian EFL learners. Moreover, no significant difference was found between concept mapping and notebook keeping in terms of their effects on self-regulation in vocabulary acquisition.

Results of the study suggest that both concept mapping and notebook keeping are effective methods in helping EFL learners to self-regulate their vocabulary acquisition. The impact of this finding can be greatly appreciated when we understand how crucial the role of vocabulary is in language learning. McCarthy (1990), Read (2004), and Schmitt (2008) have all emphasized the important role of vocabulary. McCarthy believes that vocabulary is the most important element of language learning and Schmitt (2008) maintains that success in any skills of language is dependent on the vocabulary repertoire of the learners. Accordingly, any effective effort on vocabulary learning including self-regulation is highly recommended. In this regard, Metallidou and Vlachou (2007) state that cognitive strategies for self-regulation contribute to achievement in language learning. There are many studies on the benefits of self-regulation in learning generally and in language learning more specifically, e.g. Zimmerman and Shunk (2001) argue that through self-regulation, students set their thoughts and efforts in line with achieving learning goals that ultimately lead to achievement. They further note that self-regulation is a good strategy to compensate for differences in learning because of individual differences and accordingly it has great pedagogical values. In spite of benefits of self-regulation strategies, it has been argued that learners should have the capacity to self-regulate themselves and go through the correct process of self-regulation. Therefore, the results of the study make a significant contribution to vocabulary acquisition by pointing to the effect of concept mapping and notebook keeping on the specific learner capacity to self-regulate his/her vocabulary acquisition. As Tseng and Schmitt (2008) believe, learners need to develop enough self-regulation capacity to manage their vocabulary learning strategies.

Regarding the positive effects of concept mapping and notebook keeping on self-regulation, some explanations can be put forward. In self-regulation, certain elements are essential one of which is feedback and feedback loop (Vinoom & Soman, 2016). It can be hypothesized that concept mapping and notebook keeping has provided the concrete ground for continuous feedback about the acquisition of new words. Such feedback would allow the learners to have a better monitor of their learning efforts and consequently seek ways for compensating any progress loss or better learning. Aside from feedback provision, concept mapping and notebook keeping have a built-in regulation system that may trigger the self-regulation capacity of the learners in learning vocabulary. It should not be forgotten the current study measured self-regulation capacity in vocabulary learning rather self-regulation in general sense. In concept mapping, learners need to organize the words and their connections in a meaningful way. According to Hay and Kinchin (2006), concept mapping enhances thinking processes and allows the person to have control over topics and record the information in a cognitively sound way. On the other hand, the research suggests that notebook keeping increases the use of different cognitive techniques, chance of self-management, and autonomy (e.g. Fowle, 2002). Therefore, it can be inferred that features of cognitive enhancement and control of topic in concept mapping and the systematic and organized way of dealing with new words in notebook keeping and also the self-management property of notebook keeping can trigger and contribute to the self-regulation capacity of learners in vocabulary acquisition.

In addition to the benefits of concept mapping and notebook taking of learners' self-regulated capacity as discussed above, the use of both techniques can have a direct effect on vocabulary learning of EFL learners. Both of these techniques can help the brain to better retain the learned words through making more connections. There are also several empirical studies suggesting the effectiveness of concept mapping and notebook keeping in improving vocabulary knowledge of learners. For instance, Bozkurt (2007) explored how vocabulary notebooks affected vocabulary acquisition and the attitude of teachers and learners. He found out that not only notebook keeping is a useful strategy for vocabulary acquisition, but also was positively viewed by teachers and learners. Fowle (2002) reported that notebook keeping is effective in vocabulary learning because

of fostering self-management strategies and autonomy in learners, which is quite in line with findings of the current study. With regard to concept mapping, the studies by Palmer, Boon, and Spencer (2014) and Fore, Boon, and Lowrie (2007) have pointed to the efficacy of concept mapping in learning vocabularies.

## 6. Conclusion

Based on the obtained results and the related discussion, it can be concluded that concept mapping and notebook keeping have the potential to be used not only as effective vocabulary strategies by learners but also as vehicles to enhance the capacity for self-regulating vocabulary acquisition. Accordingly, the use of concept mapping and notebook keeping are in line both with the previous conception of self-regulation that emphasized the actual strategies and also with the newer conception of self-regulation that appreciates the capacity to manage and control the vocabulary strategies.

Various educational implications can be suggested based on the fact that both concept mapping and notebook keeping positively affected the vocabulary self-regulation strategies of the learners. For instance, teachers may decide based on the preference of their students to get the learners use either concept mapping or notebook keeping as part of their vocabulary learning process. It is also essential that teachers themselves are completely familiar with the instruction of learners to use concept mapping and notebook keeping. Accordingly, training courses for teachers either in the form of pre-service or in-service can be helpful for preparing them to apply the concept mapping and notebook keeping in classroom environment.

Finally, a note of caution is necessary and that is related to the efficacy of concept mapping and notebook keeping for learning vocabulary in different teaching and learning contexts. What was found in this study may not be readily applicable in other classrooms and this issue warns the teachers and educational professionals in terms of application of the two vocabulary techniques. Based on that, ELT professionals and teachers are suggested to carry out a small scale research like action research before employing the concept mapping and notebook keeping. In addition, it needs to be examined how students feel about the efficacy of the two strategies and what are their perceptions regarding the applicability, efficacy, and their attractiveness for students. Because having negative or positive attitudes about specific strategies may dramatically affect the efficacy of the strategies.

The concept of self-regulation capacity in vocabulary acquisition is relatively new which requires further investigation for reaching a more comprehensive definition and also for seeking ways to boost it in the L2 learners. Although self-regulation capacity is theoretically sound to be included in language teaching curriculum, more investigation regarding its efficacy, effectiveness, and perception by teachers and learners seems essential.

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**References**

Abrams, L. M. (2007). Implications of high-stakes testing for the use of formative classroom assessment. In J. H. McMillan (Ed.), *Formative classroom assessment: Theory and practice* (pp. 79–98). New York, NY: Teachers College Press.

Agustín-Llach, M. (2015). Maximising incidental vocabulary acquisition in Spanish as a foreign language. *Open Journal of Modern Linguistics*, *5*(3), 262–276. doi:10.4236/ojml.2015.53023

Alipour Madarsara, F., Youhanaee, M., & Barati, H. (2015). Intentional vs. incidental vocabulary learning through games by young EFL Persian speakers. *International Journal of Research Studies in Educational Technology*, *4*(1), 23–24. doi:10.5861/ijrset.2015.943

Amirian, S. M. R., Mallahi, O., & Zaghi, D. (2015). The relationship between Iranian EFL learner's self-regulatory vocabulary strategy use and their vocabulary size. *Iranian Journal of Language Teaching Research*, *2*(1), 29–46.

Anderson, J. (2005). *Mechanically inclined: Building grammar, usage, and style into writer's workshop*. Portland, Maine: Stenhouse Publishers.

Arast, O., & Gorjian, B. (2016). The effect of listening to comic strip stories on incidental vocabulary learning among Iranian EFL learners. *Journal of Applied Linguistics and Language Learning*, *2*(1), 1–7.

Bozkurt, N. (2007). *The effect of vocabulary notebooks on vocabulary acquisition* (Unpublished Doctoral dissertation), Bilkent University, Ankara, Turkey.

Chien, C. W. (2013). Non-English major freshmen's perception and practice of the vocabulary notebook as their vocabulary learning strategy. *Studies in English Language Teaching.*, *1*(1), 64–74. doi:10.22158/selt.v1n1p64

Dornyei, Z. (2001). *Motivational strategies in the language classroom*. Cambridge: Cambridge University Press.

Ertürk, Z. O. (2016). The effect of glossing on EFL learners' incidental vocabulary learning in reading. *Procedia - Social and Behavioral Sciences*, *232*(4), 373–381. doi:10.1016/j.sbspro.2016.10.052

Fore, C., Boon, R., & Lowrie, K. (2007). Vocabulary instruction for middle school students with learning disabilities: A comparison of two instructional models. *Learning Disabilities: A Contemporary Journal*, *5*(2), 49–73.

Fowle, C. (2002). Vocabulary notebooks: Implementation and outcomes. *ELT Journal*, *56*(4), 380–388. doi:10.1093/elt/56.4.380

Ghanbari, M., & Marzban, A. (2014). Effect of extensive reading on incidental vocabulary retention. *Procedia - Social and Behavioral Sciences*, *116*(40), 3854–3858. doi:10.1016/j.sbspro.2014.01.854

Hay, D. B., & Kinchin, I. M. (2006). Using concept maps to reveal conceptual typologies. *Education and Training*, *48*(2), 127–142. doi:10.1108/00400910610651764

Horton, S. (1993). *Concept mapping and its advantages*. Hampshire, Heinle: Cengage Learning.

Kim, D. (2009). Implementing a lexical approach through a lexis notebook: A pilot study. *EFL Journal*, *7*(2), 176–219.

Kozlowski, S. W., & Bell, B. S. (2006). Disentangling achievement orientation and goal setting: Effects on self-regulatory processes. *Journal of Applied Psychology*, *91*(4), 900–916. doi:10.1037/0021-9010.91.4.900

Lewis, C. S. (2002). *The lion, the witch and the wardrobe*. New York: Harper Collins Publishers.

Lewis, M. (2008). *Implementing the lexical approach: Putting theory into practice*. Hampshire: Heinle. Cengage Learning.

Mackinnon, G. (2006). Contentious issues in science education: Building critical thinking patterns through two-dimensional concept mapping. *Journal of Educational Multimedia and Hypermedia*, *15*(4), 433–445.

McCarthy, M. (1990). *Vocabulary*. Oxford: Oxford University Press.

McCrostie, J. (2007). Examining learner vocabulary notebooks. *ELT Journal*, *61*(3), 246–255. doi:10.1093/elt/ccm032

Metallidou, P., & Vlachou, A. (2007). Motivational beliefs, cognitive engagement, and achievement in language and mathematics in elementary school children. *International Journal of Psychology*, *42*(1), 2–15. doi:10.1080/00207590500411179

Novak, J. D. (1998). *Learning, creating and using knowledge: Concept maps as facilitative tools in schools and corporations*. New Jersey: Lawrence Erlbaum & Associates, Publishers.

Novak, J. D., & Gowin, D. B. (1984). *Learning how to learn*. New York and Cambridge, United Kingdom: Cambridge University Press.

Palmer, J., Boon, R. T., & Spencer, V. G. (2014). Effects of concept mapping instruction on the vocabulary acquisition skills of seventh-graders with mild disabilities: A replication study. *Reading and Writing Quarterly*, *30*(2), 165–182. doi:10.1080/10573569.2013.818890

Pintrich, P. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, *92*(5), 544–555. doi:10.1037/0022-0663.92.3.544

Read, J. (2004). Plumbing the depths: How should the construct of vocabulary knowledge be defined. In P. Bogaards & B. Laufer (Eds.), *Vocabulary in a second language* (pp. 209–227). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Rumelhart, D. E., & McClelland, J. L. (1986). *Parallel distributed processing: Explorations in the microstructure of cognition, 1: Foundations*. Cambridge, MA: MIT Press.

Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language Teaching Research*, *12*(3), 329–363. doi:10.1177/1362168808089921

Schmitt, N. (2010). *Researching vocabulary: A vocabulary research manual*. England: Palgrave Macmillan.

Schmitt, N., & Schmitt, D. (1995). Vocabulary notebooks: Theoretical underpinnings and practical suggestions. *ELTJ*, *49*(2), 133–143. doi:10.1093/elt/49.2.133

Tseng, W. T., Dörnyei, Z., & Schmitt, N. (2006). A new approach to assessing strategic learning: The case of self-regulation in vocabulary acquisition. *Applied Linguistics*, *27*(1), 78–102. doi:10.1093/applin/ami046

Tseng, W. T., & Schmitt, N. (2008). Toward a model of motivated vocabulary learning: A structural equation modeling approach. *Language Learning.*, *58*(2), 357–400. doi:10.1111/j.1467-9922.2008.00444.x

Vinoom, P., Lyn, K., & Soman, D. (2016). The role of self-regulation in financial well-being. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation* (pp. 611–625). New York: The Guilford Press.

Wolters, C. A. (2003). Regulation of motivation: Underemphasized aspect of self-regulation. *Educational Psychologist*, *38*(4), 189–205. doi:10.1207/S15326985EP3804_1

Yesilbursa, A., & Bilican, R. (2013). Validation of self-regulatory capacity in vocabulary learning scale in Turkish. *Procedia - Social and Behavioral Sciences*, *70*(9), 882–886. doi:10.1016/j.sbspro.2013.01.134

Yigzaw, A., & Fentie, A. (2013). The impact of students' self-regulated language learning on their reading achievement in Ethiopian high schools: Grade 9 in focus. *Journal of Media and Communication Studies*, *5*(5), 44–51.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 452–502). San Diego: CA: Academic Press.

Zimmerman, B. J., & Schunk, D. H. (2001). *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, NJ: Erlbaum.

**Appendix A. Self-regulating capacity in vocabulary learning' scale (SRC voc)**
Dear Fellow Students,

This is an educational research project about learning vocabulary. Below is a series of statements about your learning experience of vocabulary. We would like to know how far these statements match your own perceptions, that is, your personal view. There are no "right" or "wrong" answers. Moreover, the data we collect are for research purposes and your opinions will be respected and kept confidential. There are twenty items in total in the questionnaire. Please tick the appropriate box concerning your personal vocabulary learning experience. Thank you very much for your cooperation!

(1) Strongly Agree
(2) Agree
(3) Partly Agree
(4) Slightly Disagree

| Number | item | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1 | Once the novelty of learning vocabulary is gone, I easily become impatient with it. | | | | | | |
| 2 | When I feel stressed about vocabulary learning, I know how to reduce this stress. | | | | | | |
| 3 | When I am studying vocabulary and the learning environment becomes unsuitable, I try to sort out the problem. | | | | | | |
| 4 | When learning vocabulary, I have my special techniques to achieve my learning goals. | | | | | | |
| 5 | When learning vocabulary, I have my special techniques to keep my concentration focused. | | | | | | |
| 6 | I feel satisfied with the methods I use to reduce the stress of vocabulary learning. | | | | | | |
| 7 | When learning vocabulary, I believe I can achieve my goals more quickly than expected. | | | | | | |
| 8 | During the process of learning vocabulary, I feel satisfied with the ways I eliminate boredom. | | | | | | |

(*Continued*)

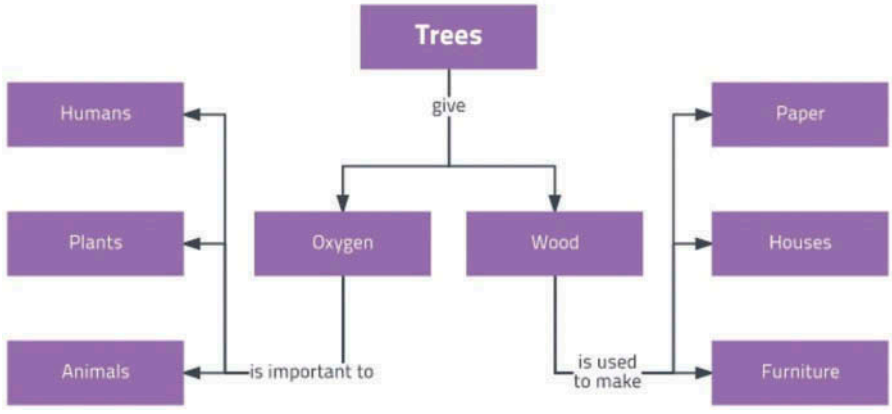
***(Continued)***

| Number | item | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 9 | When learning vocabulary, I think my methods of controlling my concentration are effective. | | | | | | |
| 10 | When learning vocabulary, I persist until I reach the goals that I make for myself. | | | | | | |
| 11 | When it comes to learning vocabulary, I have my special techniques to prevent procrastination. | | | | | | |
| 12 | I believe I can overcome all the difficulties related to achieving my vocabulary learning goals. | | | | | | |
| 13 | When learning vocabulary, I know how to arrange the environment to make learning more efficient. | | | | | | |
| 14 | When I feel stressed about my vocabulary learning, I cope with this problem immediately. | | | | | | |
| 15 | When it comes to learning vocabulary, I think my methods of controlling procrastination are effective. | | | | | | |
| 16 | When learning vocabulary, I am aware that the learning environment matters. | | | | | | |
| 17 | During the process of learning vocabulary, I am confident that I can overcome any sense of boredom. | | | | | | |
| 18 | When feeling bored with learning vocabulary, I know how to regulate my mood in order to invigorate the learning process. | | | | | | |

(*Continued*)

| Number | item | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 19 | When I feel stressed about vocabulary learning, I simply want to give up. | | | | | | |
| 20 | When I study vocabulary, I look for a good learning environment. | | | | | | |

(5) Disagree
(6) Strongly Disagree




**Appendix B. Sample concept map presented to students**

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