The effect of cooperative learning approach and semantic mapping strategy on the acquisition of L2 Persian vocabulary

Amirreza Vakilifard, Khosro Bahramlou and Moslem Mousavian

Abstract: Acquiring L2 Persian vocabulary is the main hurdle for foreign students who wish to pursue academic studies in Iranian universities. This study explored the effect of the cooperative learning approach and semantic mapping strategy on the acquisition of L2 Persian vocabulary. The study had a quasi-experimental design and included a control group and three experimental groups. In each group, there were 30 intermediate learners of L2 Persian. The participants took a vocabulary pretest and then read three texts each of which contained 10 potentially unfamiliar words. The control group learned vocabulary through direct oral translation (DT). In the experimental groups, the words were learned through cooperative learning approach (CL), semantic mapping strategy (SM), or cooperative learning approach plus semantic mapping strategy (CLSM). A posttest was used to measure vocabulary learning. Results revealed that, in comparison to the control group, in experimental groups, the learners acquired significantly more vocabulary. In terms of mean score on the posttest, SM group ranked the first. It is recommended that L2 Persian materials developers and instructors consider alternative methods of teaching vocabulary such as semantic mapping strategy and cooperative learning approach.

Keywords: vocabulary learning; cooperative learning approach; semantic mapping strategy; semantic fields; schema

ABOUT THE AUTHOR

Dr. Amirreza Vakilifard holds a PhD degree in Applied Linguistics and is an Associate Professor at Imam Khomeini International University. His main area of research involves teaching Persian as a second language. In collaboration with his students and colleagues, he has explored various aspects of teaching and learning Persian as a second language. In this study, Dr. Vakilifard and his colleagues, Dr. Khoosro Bahramlou, and Mr. Moslem Mousavian, investigated the effect of cooperative learning approach and semantic mapping strategy on the acquisition of L2 Persian vocabulary.

PUBLIC INTEREST STATEMENT

In the recent years, many foreign students from the neighboring countries have enrolled in Iranian universities. Before these students begin their studies in their respective majors, they must attain proficiency in Persian language. One area in which Persian language learners experience many difficulties relates to the acquisition of many words that are required for academic studies in Persian language. In this study, we explored the effect of the cooperative learning approach and semantic mapping strategy on the acquisition of L2 Persian vocabulary. We hypothesized that the use of cooperative learning approach and semantic mapping strategy could improve vocabulary learning. Our results supported these hypotheses.
1. Introduction
One of the main concerns for the learners of Persian as a Second Language (PSL) who wish to pursue academic studies in Iranian universities relates to vocabulary learning. Part of the learners’ problem with the vocabulary of Persian language could be attributed to the ways in which Persian language is taught in Persian language schools. PSL classes are teacher-centered classes in which the learners passively listen to the teacher’s lecture. Teacher-learner and learner-learner interactions are not common in such classes. Questions which are directed at the learners are not meant to stimulate learner involvement with the task, but to prepare the learners for examination. In such a situation, the teacher is more active than the learners. The teacher presents the lesson orally and the learners listen and try to comprehend the instruction. We believe that, to amend the situation, PSL classes should become learner-centered and try to actively engage the students in learning. To this end, teacher-learner and learner-learner interactions should be encouraged. To realize these conditions, alternative ways and methods of teaching vocabulary should be experimented with.

To avail learners’ concerns and aid them in the acquisition of Persian vocabulary, various approaches to vocabulary teaching could be adopted. In this study, cooperative learning approach and semantic mapping strategy were used to teach Persian vocabulary to PSL learners. Cooperative learning refers to learners learning from one another within a group. In this approach, language learning is facilitated through the interaction of learners with one another through the medium of L2 (Freeman & Anderson, 2012). Through this approach, learner-learner interactions are realized in the classroom in the hope that their vocabulary could be improved. Semantic mapping is one of the vocabulary teaching strategies which involves drawing a graphic representation of the interrelationships among various words and concepts which appeared in a specific text (Stahl & Vancil, 1986). In this method, through learner-learner and teacher-learner interactions, interrelationships among keywords and concepts of a text are identified and thus it is expected that students’ learning would improve. Studies have shown that compared to traditional methods of teaching language, cooperative approaches lead to better performance and acquisition (Whicker et al., 1997).

2. Theoretical background
Cooperative learning is an approach to learning which emphasizes learning through collaboration. In this approach, what the teacher does is replaced by what the learners do collaboratively to manage their own learning (Ingleton et al., 2000). It could be stated that cooperative learning has been a turning point in the effort to improve learning conditions, activate learners in the classroom, and enhance learners’ social skills. Gokhale (1995) described cooperative learning as an educational approach in which learners collaboratively work in small groups to achieve a shared goal. Learners are responsible for their own learning and that of the others. A learner’s success could assist with the success of other learners. In defining cooperative learning, Onwuegbuzie (2001) emphasized the collaboration of learners within small groups and their effort to maximize their own and their groups’ learning. This reminds us of the socio-cultural theory of mind which posited that human cognitive abilities germinate in interpersonal social interaction and then gradually become intrapersonal (Lantolf & Poehner, 2008). In cooperative learning, students engage in social interaction and through this interaction, more capable learners mediate between the learning task and the less capable learners and thus help them learn and develop.

Cooperative learning, in essence, refers to language learners learning from each other in a group. What sets cooperative learning apart is not related to the grouping of learners alone, but it is in the way learners and teachers work with each other. In this approach, the teacher helps the learners develop group work or social skills so that they could communicate with each other more effectively. The learners are encouraged to think based on positive interdependence. That is, the learners act non-competitively and non-individually and based on collaboration for the group. Usually, the teacher determines the group members so that the group is a mix of males, females, different racial groups, different ability levels, etc. This helps the learners to learn from one another.
and is a practice for them to adapt themselves with people who are different from them. Social skills such as appreciation of other’s participation, invitation of others to participate, and keeping the atmosphere of interactions calm should be directly taught. Though the learners work with each other, each learner is held responsible for his/her success. In cooperative learning, language learning is facilitated through learner–learner interaction in the target language (Freeman & Anderson, 2012). To us, this sounds very much like mediation in socio-cultural theory. In mediation sessions, interactants are of different ability levels, e.g., a teacher and a learner or a more capable student, and a less capable student. The more capable person interacts dialogically with the less capable person to perform a learning task and reach its objectives. The capable interactant begins with material that is within the learner’s grasp and gradually moves to more challenging aspects of the task. His/her barometer for this is the reactions or responsiveness of the learner to tutor’s hints and guidance. Whenever the learner shows signs of difficulty in something, the tutor provides more and more explicit hints to help him/her to realize the task objectives. Through these interactions, both interactants undergo change and thus development (Aljaafreh & Lantolf, 1994).

Srinivas (2010) described cooperative learning as an approach to teaching and learning which engages groups of learners in collaborative work to solve a problem, perform a task, or to create a product. He believed that in its essence, cooperative learning is a social action whose participants interact through language and through verbal interaction learning takes place.

Cooperative learning draws on the assertion that human cognition is rooted in the society and culture and that cognitive development occurs first in the interpersonal (interaction with the social environment) and then in the intrapersonal plane. This approach to learning emphasizes the construction of meaning out of active participation in appropriate social, cultural, historical, and political contexts. This approach underlines the learner-centeredness of the teaching. Learner-centered pedagogy involves the teaching in which, with the help of teacher, the learners take the responsibility of understanding and grasping the objects of learning (Seif, 2007) and the teacher trusts in the ability of the learners to assume the responsibility of their own learning. It is assumed that a person learns by experiencing the world and thinking about that experience. That is, the person actively shapes his/her own knowledge. Indeed, knowledge is shaped while the learners actively attempt to arrive at an understanding of their own experiences. The learners interpret the new data and weave them into existing structures that have been constructed as a result of previous experiences.

In cooperative learning approach which draws on constructivism theory, the learner constructs his/her own knowledge through active and constant interaction with the environment. Thus, knowledge is assumed to be learner dependent. That is, under similar circumstances, different learners construct different understandings of the same event. In other words, knowledge acquisition rests on the learner’s active participation in the event and it is the learners themselves who construct their own schemas. As new learning opportunities arise schemas are reevaluated, developed, or reconstructed. Previous knowledge acts as a framework within which new learning takes place (Mesrabadi et al., 2005). In our view, this resembles the processes which occur in mediation sessions of socio-cultural theory. In such sessions, the learner responds to the tutor’s hints and through this, responsiveness to tutor’s meditational moves demonstrates the minute details of his knowledge and ability (Aljaafreh & Lantolf, 1994). Since each person differs from others in detail of his/her knowledge and ability, the learning which occurs to each individual is different from the learning which occurs to any other individual.

Another way of enhancing learners’ active participation in word learning involves semantic mapping strategy. Semantic mapping is one of the vocabulary teaching strategies which belongs to the category of graphic organizers (Vaughn & Edmonds, 2006). Graphic organizers are indeed spatial metaphors that illustrate the interrelationships among concepts within a node-link-node model (Jonassen et al., 1993). Semantic maps are visual reconstructions which demonstrate the relationships among the essential words and concepts of a text (Jones, 2006). Semantic mapping
is an activity that helps the brain to become aware of the relationships among a text’s words (Morgan, 2003). We believe that semantic mapping could be used to enhance the learning and memorization of lexical items since it allows the learners to integrate new lexical items with their already existing vocabulary knowledge.

White (1988) stated that association among words helps build networks of association and the resulting knowledge could help the learners to discover the meaning of the words and ultimately to use them in appropriate circumstances. De Debat (2006) noted that semantic mapping is an effective vocabulary teaching strategy that enables the teachers to evaluate the learners’ already existing word knowledge and the accessibility of their schemata. However, Tinkham (1993) and Waring (1997) advised against using semantic mapping and emphasized that the learners should begin vocabulary learning with unrelated words. Laufer (1997) is also against learning related words.

Theoretical basis of semantic mapping strategy goes back to schema theory. Schema theory stated that, in human mind, knowledge is organized in units which are called schemata. That is, schemata are knowledge structures that have been committed into long-term memory (Vaezi, 2006). In Rumelhart’s (1980) view, schema theory explains that for any knowledge to be committed into long-term memory, it must be integrated into its relevant already available schemata. In our view, what semantic mapping does is that it helps learners relate the new lexical items of a text to the relevant vocabulary and conceptual knowledge that is already available in their mind.

Singhal (1998) identified three types of schema which include content, formal, and linguistic schemas. Content schema relates to a reader’s background or world knowledge. It gives the readers a basis for comparison. Formal or textual schema directly relates to the organizational forms and rhetorical structures of written texts. It involves knowledge of different text types and genres and their text organization, language structures, vocabulary, grammar, and level of formality/register. Linguistic schema involves the decoding elements which enable the reader to recognize the words and to know how the words are combined to form a sentence.

In some circumstances, the learners possess the necessary schemata for L2 reading comprehension; however, they cannot activate it. Cook (1989) stated that a text’s keywords and expressions or schemata could trigger the mind. This implies that in reading, all processing is not conscious and some external stimuli could trigger automatic cognitive responses. Our rationale for using semantic mapping in this study is that we believe our learners possess the necessary schemata for reading and learning new lexical items but they are not proficient in accessing and using those resources. Through semantic mapping, we want to help them access and use their already existing word knowledge and anchor their new lexical knowledge in their schemata.

3. Review of literature

3.1. Cooperative learning approach

Many studies have explored cooperative learning approach and their findings indicate that cooperative learning has a positive effect on learners’ performance. From a review of a number of studies that were conducted in Iran, Sirafi (1995) concluded that in comparison to traditional teacher fronted classes, cooperative learning classes lead to more academic achievement for the learners. Neisi et al.’s (2004) study showed that in terms of academic achievement, progress motivation, and self-conception, the learners who received cooperative learning treatment outperformed the learners who were taught through traditional methods. Faghihi’s (1992) review of studies indicated that various renditions of cooperative learning improved learners’ performance regardless of gender, proficiency, and residence in rural or urban districts. Jabbari (2005) explored the effect of cooperative learning on the comprehension of late-learning students. Findings of the study revealed that in the cooperative learning group, pretest to posttest progress was significant. In Hosseini’s (2009) study, the positive effect of
cooperative learning on the learners’ critical thinking was demonstrated. McConnell et al. (2005) conducted a study in which the learners’ critical thinking skills were compared in two groups that received traditional and cooperative learning treatments. Results showed that learners’ increased participation in the class associated with the development of critical thinking skills. Carini et al. (2006) explored the effect of the learners’ participation in the class on their learning. Results indicated that learner involvement in class helped learners to achieve higher levels of thinking.

Mesrabaadi et al. (2005) compared the individual and group approaches to concept mapping and also contrasted the delivery of prepared concept maps to learner developed concept maps. The sample consisted of 55 elementary school teachers who had enrolled in an in-service course called “Knowing the exceptional children”. A pretest-posttest quasi-experimental design was adopted. There were three experimental groups. The first experimental group received prepared concept maps during the learning process. In the second group, the learners developed concept maps individually. The learners of the third group developed concept maps collaboratively. The results of the study showed that in all experimental groups, there was an improvement in scores from pretest to posttest. Individual development of concept map lead to most learning and the delivery of the prepared concept maps had the least effect on learning.

Khamesan and Baradarankhaksar (2011) explored the effect of individual and collaborative concept mapping on learning EFL. A pretest-posttest quasi-experimental design with a control group was used. Thirty-three intermediate EFL learners who were available to the researchers were randomly assigned to three groups. In the control group, traditional teaching was used. In the second and third groups, individual and collaborative concept mapping was used, respectively. The groups were compared in terms of vocabulary and reading comprehension. The results indicated that in the collaborative concept mapping group, vocabulary and reading comprehension scores were significantly higher than those of traditional teaching group. In the individual concept mapping group, reading comprehension score was significantly higher than that of the traditional teaching group. However, the two groups were not significantly different in terms of vocabulary learning. These findings implied that concept mapping especially collaborative concept mapping could be used to improve L2 vocabulary learning and reading comprehension.

The above review of studies indicates that cooperative learning exerts a positive effect on academic achievement, motivation, comprehension, critical thinking, and L2 learning. This could be explained in terms of the principles of the socio-cultural theory of mind. In this theory, learning is believed to be a dynamic process of development that starts in social interaction. When humans interact with one another, they mediate each other into higher levels of thinking and performance when one side of the interaction shows signs of a problem with comprehension or performance of a task. In the above studies, learners of different ability levels collaborated in performing study tasks. We believe this created the conditions for mediational interaction. In cooperative learning groups, through mediational assistance, higher ability learners mediated their less capable peers to higher than normal performance. That is, less capable learners received individualized intervention which directly addressed their problem areas which could not be dealt with in regular classrooms which tend to be geared toward the group mean. This might explain the better performance of cooperative learning groups in comparison to control groups.

3.2. Semantic mapping strategy
Tateum (2007) used semantic mapping as a pre-reading activity to improve EFL learners’ reading comprehension and background knowledge. Forty-two pre-intermediate university students were assigned to a control and an experimental group. Both groups read a text and did some post-reading activities. A comprehension test was administered as the posttest. As a pre-reading activity, the experimental group engaged in semantic mapping and the control group engaged in listening comprehension. On the posttest, the experimental group’s mean score was
significantly higher than that of the control group. It was concluded that pre-reading semantic mapping could have a positive effect on learners’ reading comprehension.

Amoush (2012) explored the effect of semantic mapping on the reading comprehension of university EFL students. From a 600 person population, 50 learners were randomly selected to participate in the study. They were assigned to two groups. Learners of the experimental group received semantic mapping treatment and those of the control group were taught through traditional teaching methods. To measure reading comprehension before and after treatment, a pre- and post-test was administered. Results showed that in comparison to the control group, learners of the experimental group experienced significantly more improvement from pre- to post-test. This means that semantic mapping improved the learners’ reading comprehension.

Dilec and Yuruk (2013) explored the effect of semantic mapping on vocabulary learning in pre-intermediate language learners. The study had an experimental design. Thirty-two university students were assigned to two groups. In the control group, the words were taught through the traditional method. In the experimental group, semantic mapping was used to teach vocabulary. A vocabulary test was used to measure word knowledge before and after the treatment. The results indicated that semantic mapping leads to more vocabulary learning.

Keshavarz et al. (2006) investigated semantic mapping and vocabulary learning in intermediate EFL learners. The role of gender was also considered. One hundred and thirty-four students participated in the study. The learners were assigned to four groups. Two groups were female only and two groups were male only. One male and one female group acted as the experimental groups and the other two groups acted as control groups. A vocabulary test was administered before and after the treatment. In eight sessions, learners of experimental groups learned words through semantic mapping. Members of the control groups received traditional teaching of vocabulary. On the posttest, a significant difference was observed between the control and experimental groups. No interaction was observed between the effect of semantic mapping and gender. It was concluded that regardless of gender, semantic mapping exerted a significant effect on the vocabulary learning of the Iranian EFL students.

Abdollahzadeh and Amiri (2009) were interested in the effect of semantic mapping on the word learning of EFL students who had different learning styles. A vocabulary test was used to select participants. One hundred and ninety-six adult EFL learners who studied at various language schools were chosen. The participants were assigned to two groups. The control group encompassed nine classes and the experimental group consisted of eight classes. Texts written for the intermediate learners were used to teach vocabulary. A questionnaire was administered to identify the learners’ learning styles. A vocabulary posttest was used to assess the effect of the treatment. Results indicated that in comparison to traditional vocabulary teaching, semantic mapping was more effective in improving the learning and memorization of vocabulary items.

In Saeidi and Atmani (2011) study, semantic mapping was used as a pre-reading activity to teach vocabulary. Gender effect was also considered. Through a proficiency test, 120 intermediate EFL learners were selected as participants. There were 60 males and 60 females in the sample. The learners were assigned to four groups. The experimental condition included a male and a female group. A male and a female group appeared in the control condition. Before and after the treatment, a vocabulary test was administered to measure the learners’ vocabulary learning. The treatment text was chosen from a book that had been written for intermediate level learners. The experimental condition received pre-reading semantic mapping. However, there was no semantic mapping in the control condition. A significant difference was observed between the experimental and control conditions. It was concluded that semantic mapping improved word learning. No significant difference was observed between male and female learners who received semantic mapping. This meant that semantic mapping is beneficial for both genders.
Zahedi and Abdi (2012) focused on the effect of semantic mapping on vocabulary learning in Iranian EFL learners. A proficiency test was used to select a homogenous sample of 40 female university students. Two hundred words were selected for teaching. Learners were randomly assigned to two groups. In the experimental group, the words were taught through a semantic mapping strategy. The learners of the control group received a direct translation of the words. The learners were pre- and post-tested on target words. The findings of the study showed that semantic mapping significantly affected word learning in Iranian EFL students.

In the above paragraphs, we reviewed studies which had explored the effect of semantic mapping strategy on L2 learners’ reading comprehension and vocabulary learning. Overall, they indicate that semantic mapping significantly improved reading comprehension and vocabulary learning in L2 learners. Better performance of semantic mapping groups on posttests might be explained in terms of the fact that through semantic mapping the relations among key concepts and lexical items of the texts were explicated and thus they were anchored in the learners’ already existing knowledge structures and schemata. This led to a better acquisition of L2 words.

4. Research method

4.1. Participant selection
The population of the study included the intermediate PSL learners of Imam Khomeini University’s Persian Language Teaching Center (PLTC). The learners’ proficiency had been measured upon entry to the center through PLTC’s proficiency test which included reading, writing, listening, and speaking sections. Through random cluster sampling, four intact classes each containing 30 intermediate students were selected as the participants. One class acted as the control group and the other groups acted as experimental groups. The sample contained 98 males and 22 females. As their L1, 98 learners spoke Arabic, 8 spoke Urdu, 6 spoke Turkish, and 8 spoke Tajiki.

4.2. Instruments

4.2.1. Reading texts
Three level-appropriate texts were selected each of which contained 10 potentially unfamiliar words. They dealt with themes of banks, freedom, and depression. The freedom and bank texts were drawn from Vakilifard and Madani (2002). The depression text was drawn from www.daneshnameh.roshd.ir and www.pezeshk.us.

4.2.2. Vocabulary test
To test the learners’ knowledge of 30 target words before and after the treatment, a 30 item multiple-choice vocabulary test was developed. To avoid giving the goal of the study away, 70 items from an already available vocabulary test were added to the test so that ultimately the vocabulary test had 100 items. However, the target word items alone were included in the scoring. The test was piloted on 42 learners who were similar to the sample in terms of proficiency level. The reliability of the test was measured through Cronbach’s alpha which was 0.74. The order of the items and the alternatives of each item were different in the pretest and the posttest versions of the vocabulary test.

4.3. Variables
The independent variable was the teaching approach which had four levels including direct translation (DT), cooperative learning approach (CL), semantic mapping strategy (SM), and cooperative learning approach plus semantic mapping strategy (CLSM). The dependent variable was the amount of word learning after the treatment.

4.4. Procedure
Two weeks before the treatment, the pretest version of the vocabulary test was administered to the sample to see how many of the target words were indeed familiar to individual learners. Four
intact classes were randomly selected to act as control, CL, SM, and CLSM groups. In three consecutive sessions which were 7 days apart, the three texts were presented to the sample and the target words were taught to the learners. Each session lasted around 90 minutes. The DT, CL, SM, and CLSM groups learned the words through direct oral translation, cooperative learning approach, semantic mapping strategy, and cooperative learning approach plus semantic mapping strategy, respectively. Two weeks after the treatment, the posttest version of the vocabulary test was administered to the sample to see how many of the target words were familiar to individual learners.

In the control group, direct oral translation was used. The teacher read the text aloud as the learners listened and silently followed the text. Then, the learners were asked to read the text again paragraph by paragraph and indicate the words which were unfamiliar. Then, the teacher provided the learners with the direct oral translation of the unfamiliar words.

The cooperative learning approach was operationalized as follows: The class of 30 learners was divided into five equal-sized groups. Each group was asked to read the text and discuss the words which had been highlighted. In addition, each student had to focus more intensely on two words of his/her choosing. Then, the learners who had intensely focused on the same word were asked to get into a group and to share their knowledge of the word which they attended to more intensely. After this stage, the learners returned to their original groups and shared with their group members what they had learned from members of other groups.

A semantic mapping strategy was implemented as follows: Regarding the theme of the text, a keyword was written on the board and the learners were asked to mention the words they remembered when they thought of the target word. The teacher listed the words associated with the keyword on the board. Then, with the help of the learners, the teacher classified the words into different groups and chose a label for each group. The words which were classified into each group were linked to each other through lines. This was the pre-reading semantic map. Then, the text was read aloud for the whole class. The teacher discussed the text’s words especially new words with the learners and with their cooperation revised the pre-reading semantic map. An attempt was made to include all the text’s new words in the ultimate semantic map.

The cooperative learning approach plus semantic mapping strategy was operationalized as follows: Regarding the theme of the text, a keyword was written on the board and in collaboration with students, a pre-reading semantic map was developed. The class was divided into equal-sized groups. The text was read aloud by the teacher as the learners read along silently. The learners discussed the target words and in the meantime, each student focused more intensely on two target words of his own choice. Those learners who had focused intensely on similar words were encouraged to get into a group and share their knowledge of the words. The learners were asked to return to their original groups and share what they had learned from the members of other groups with their groupmates. Each group was asked to discuss the text’s words within themselves and draw a semantic map that encompassed all the words of the text.

4.5. Statistical analysis
To see whether vocabulary instruction had any effect on word learning, each group’s mean scores on pretest and posttest were compared via paired samples t-test. If a significant change was observed from pretest to posttest, it would be stated that the relevant intervention improved the word learning.

To see whether the learners of the experimental groups outperformed those of the control group on the posttest, the mean score of each experimental group on the posttest was compared to that of the
control group via independent samples t-test. When a significant difference was observed between the mean scores of an experimental and the control group, it would indicate that the intervention of the experimental group leads to more word learning in comparison to the control group intervention.

To see which treatment had the most positive effect on word learning, Freedman test was used to rank order the groups’ mean scores on the posttest.

5. Results
The group means on the pretest and posttest are presented in Table 1. In all the groups, posttest score is higher than the pretest score which indicates that in all the groups’ learners have learned some of the target vocabularies through the treatment.

To see whether the treatments have increased the learners’ knowledge of target words, in each group, the means of the pretest and posttest scores were compared. Table 2 presents the results of the t-test analyses. The results show that in all the groups, pretest and posttest scores are significantly different. This means that all the treatments have been effective in increasing the learners’ knowledge of the target words.

To see whether treatments of experimental groups were more successful than that of the control group in promoting word learning, the experimental groups’ mean scores on the posttest were compared to that of the control group one by one. The results of the t-test analyses are presented in Table 3. As indicated, the means of experimental groups are significantly higher than that of the control group. This means that the learners of the experimental groups have acquired more target words than the learners of the control group.

To see which treatment lead to more vocabulary learning, Freedman test was used to rank order the three experimental groups in terms of their posttest means. In Table 4, the results of the test

| Table 1. Groups’ mean scores on pretest and posttest |
|-----------------------------------------------|
| **Teaching method** | **N** | **Mean** | **SD** | **Standard error of mean** |
| DT | Posttest | 30 | 18.533 | 1.995 | 364.0 |
| | Pretest | 30 | 13.333 | 482.2 | 453.0 |
| CL | Posttest | 30 | 600.25 | 338.3 | 609.0 |
| | Pretest | 30 | 466.14 | 360.3 | 613.0 |
| SM | Posttest | 30 | 29.256 | 1.142 | 0.6130 |
| | Pretest | 30 | 466.14 | 360.3 | 613.0 |
| CLSM | Posttest | 30 | 27.933 | 2.242 | 0.408 |
| | Pretest | 30 | 13.600 | 2.159 | 0.394 |

| Table 2. The difference between each group’s means on the posttest and the pretest |
|-----------------------------------------------|
| **Teaching method** | **Mean difference** | **SD** | **95% Confidence interval of the difference** | **t value** | **Degree of freedom** | **Significance level** |
| | | | **Lower** | **Higher** | | |
| DT | 200.5 | 996.0 | 827.4 | 572.5 | 580.28 | 29 | 0.000 |
| CL | 133.11 | 285.2 | 279.10 | 986.11 | 682.26 | 29 | 0.000 |
| SM | 133.15 | 851.1 | 441.14 | 824.15 | 756.44 | 29 | 0.000 |
| CLSM | 14.333 | 0.884 | 14.003 | 14.663 | 88.800 | 29 | 0.000 |
show that SM, CL, CLSM, and the DT groups hold the first, second, third, and fourth places, respectively. This means that SM strategy had the most positive effect on learners’ acquisition of the target words.

6. Discussion and conclusion
A comparison of each group’s mean scores on pretest and posttest (Table 2) showed that in all the groups, significant improvements have been made in the learners’ knowledge of the target words. The fact that, in all groups, mean posttest scores were higher than mean pretest scores indicates that some word learning has taken place in all groups. This might be explained in terms of time on task and noticing. When learners spend time on word learning and the potential unfamiliar words of a text are brought to the attention of the learners, the learners are made to notice those new words and register their meanings in their memories and later recall them. Schmidt (1990) stated that noticing was a prerequisite for learning and that which is not noticed will not be learned.

A comparison of the cooperative learning group’s mean score on the posttest to that of the control group (Table 3) showed that the learners of the cooperative learning group have learned more target words than those of the control group. With regard to cooperative learning approach, the findings of this study accord with the findings of Sirafi (1995), Neisi et al. (2004), Faghihi (1992), Jabbari (2005), Hosseini (2009), McConnell et al. (2005), Carini et al. (2006), and Mesrabadi et al. (2005) which had explored the effect of cooperative learning approach on various aspects such as academic achievement, reading comprehension, critical thinking, and vocabulary knowledge. For instance, Khamesan and BaradaranKhaksar (2011) compared the effect of traditional and collaborative learning methods on word learning and reading comprehension. In the collaborative learning group, word learning and reading comprehension were significantly higher than those in the traditional learning group.

In Gokhale’s (1995) view, cooperative learning is an educational approach that requires learners to work collaboratively in small groups to realize a shared goal. Onwuegbuzie (2001) stated that within small groups, learners collaborate in an effort to maximize their own and their groups’

| Compared groups | F value | Sig. | t value | Sig. (2 tailed) | Mean difference | 95% Confidence interval of the difference |
|-----------------|---------|------|---------|----------------|----------------|------------------------------------------|
| DT vs SM        | 402.12  | 001.0 | 567.25  | 000.0          | 733.10         | 892.9 to 573.11                           |
|                 |         |       |         |                |                |                                          |
|                 | 567.25  | 000.0 | 733.10  | 000.0          | 888.9          | 578.11                                   |
| DT vs CL        | 780.9   | 003.0 | 952.9   | 000.0          | 066.7          | 645.5 to 488.8                           |
|                 |         |       | 952.9   | 000.0          | 066.7          |                                          |
|                 | 952.9   | 000.0 | 066.7   | 000.0          | 638.5          | 494.8                                    |
| DT vs CLSM      | 0.910   | 0.034 | 17.151  | 0.000          | 9.400          | 8.302 to 10.497                          |
|                 | 17.151  | 000.0 | 9.400   | 000.0          | 8.302          |                                          |
|                 |         |       | 9.400   | 000.0          | 8.302          |                                          |

Table 3. The difference between group means on the posttest
learning. According to Freeman and Anderson (2012), in cooperative learning, the group is a mix of males, females, different racial groups, different ability levels, etc. to help the learners learn from one another and adapt themselves with people who are different from them. In the CL group of the current study, learners actively participated in the task and collaborated to share their knowledge of the words. The learners of each group were not homogeneous in terms of proficiency. This triggered them to cooperate with each other and share their cultural, social, and linguistic experiences. This might explain the superior performance of the group in comparison to the control group.

The results of the study showed that in comparison to direct translation, semantic mapping leads to more vocabulary learning. This finding is in line with the findings of previous studies such as Keshavarz et al. (2006), Abdollahzadeh and Amiri (2009), Saeidi and Atmani (2011), Zahedi and Abdi (2012), and Keshavarz et al. (2006) compared semantic mapping strategy and traditional teaching in terms of their effect on vocabulary learning. The results showed that semantic mapping exerted a significant effect on the vocabulary learning of the Iranian EFL students. Abdollahzadeh and Amiri (2009) demonstrated that in comparison to traditional vocabulary teaching, semantic mapping was more effective in improving the learning and memorization of vocabulary items. In Saeidi and Atmani (2011) study, the experimental condition received pre-reading semantic mapping. However, there was no semantic mapping in the control condition. Results showed that semantic mapping significantly improved word learning. In Zahedi and Abdi (2012) study, in the experimental group, the words were taught through a semantic mapping strategy. However, the learners of the control group received a direct translation of the words. The findings of the study showed that semantic mapping significantly affected word learning.

In this part, an attempt is made to explain the better word learning in the semantic mapping group in comparison to the traditional method. As visual reconstructions which show the relationships between essential words and concepts of a text (Jones, 2006), semantic maps could be used to integrate new lexical items with learners’ already existing vocabulary knowledge and thus improve memorization and learning of those words. Semantic mapping draws on schema theory which deals with how knowledge is represented and used in the mind (Rumelhart, 1980). According to schema theory, knowledge is organized in units called schemata. Vaezi (2006) defined schemata as knowledge structures committed into long-term memory. In the current study, by drawing semantic maps, the learners integrated the new word knowledge into their already existing word knowledge and this facilitated the memorization of the newly met words. In the SM group, learners listed the words which they associated with the theme of the text and classified them into various groups and labeled each group. By drawing a semantic map of the relationships between the words, the learners consolidated their knowledge of the words’ meanings in an organized manner which later helped them to recall the words efficiently. This implies that words are stored in semantic fields and related networks in the mind.

Semantic mapping had the most positive effect on word learning. The results of Freedman test (Table 4) showed that in terms of their means on the posttest, SM, CL, CLSM, and DT groups held the first, second, third, and fourth places, respectively. It might be due to the fact that developing a semantic map automatically requires collaboration among the learners. Though the collaboration was not as elaborate as the one which happened in the CL group, nevertheless, the attempt to

| Vocabulary teaching method | Mean of the rank | Rank order |
|----------------------------|-----------------|------------|
| SM                         | 3.73            | 1          |
| CLSM                       | 3.13            | 2          |
| CL                         | 2.13            | 3          |
| DT                         | 1.00            | 4          |

Table 4. The results of Freedman test for rank order of vocabulary teaching methods

Vakilifard et al., Cogent Education (2020), 7: 1762287
https://doi.org/10.1080/2331186X.2020.1762287
develop the semantic map made the learners engage in all-out cooperation. That is, the semantic mapping performed a dual function. Besides acting as a graphic memory aid, the strategy encouraged learners’ collaboration and active participation in the task. It appears that this explained the more positive effect of semantic mapping on word learning.

From the above discussion, it is concluded that, in comparison to direct translation, alternative methods of teaching vocabulary such as cooperative learning approach, semantic mapping strategy, or a combination of the two lead to more vocabulary learning. Thus, L2 Persian materials developers and instructors are recommended to draw on these alternative methods of teaching vocabulary and integrate them into their materials and lesson plans.

**Funding**
The authors received no direct funding for this research.

**Author details**
Amirreza Vakilifard
E-mail: amirreza.vakilifard@gmail.com
Khosro Bahramlou
E-mail: khosro.bahramlou@yahoo.com
Moslem Mousavian
E-mail: arbeiter333@yahoo.com

1 Persian Language Teaching Center, Imam Khomeini International University, Qazvin, Iran.
2 Department of English Language and Literature, Razi University, Kermanshah, Iran.
3 Department of Persian Language and Literature, Allameh Tabatabai University, Tehran, Iran.

**Citation information**
Cite this article as: The effect of cooperative learning approach and semantic mapping strategy on the acquisition of L2 Persian vocabulary, Amirreza Vakilifard, Khosro Bahramlou & Moslem Mousavian, Cogent Education (2020), 7: 1762287.

**References**
Abdollahzadeh, E., & Amini, N. (2009). The effect of semantic mapping as a vocabulary instruction technique on EFL learners with different perceptual learning styles. *Journal of English Language Pedagogy and Practice*, 2(4), 1–27. http://jol.iout.ac.ir/article_524139.html
Aljaafreh, A., & Lantolf, J. P. (1994). Negative feedback as regulation and second language learning in the Zone of Proximal Development. *The Modern Language Journal*, 78(4), 465–483. https://doi.org/10.1111/j.1540-4781.1994.tb02064.x
Amoush, K. H. (2012). The effectiveness of using “semantic mapping strategy” on reading comprehension of Jordanian university students. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6), 714–729. https://journal-archives24.webs.com/714-729.pdf
Carini, R. M., Kuh, G. D., & Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, 47(1), 1–32. https://doi.org/10.1007/s11162-005-8150-9
Cook, G. (1989). *Discourse in ‘Language testing: A scheme for teacher education’ series*. Oxford University Press.
De Debat, E. V. (2006). Applying current approaches to the teaching of reading. *English Teaching Forum*, 44(1), 8–15. https://files.eric.ed.gov/fulltext/EJ1107882.pdf
Dilec, Y., & Yuruk, N. (2013). Using semantic mapping technique in vocabulary teaching at pre-intermediate level. *Procedia - Social and Behavioral Sciences*, 70, 1531–1544. https://doi.org/10.1016/j.sbspro.2013.01.221
Forghani, F. (1992). A summary of the studies about cooperative learning. *Quarterly Journal of Education*, 4(30), 114–130. http://ensani.ir/file/download/article/20110218151229-198.pdf
Freeman, L., & Anderson, M. (2012). Techniques and principles in language teaching. OUP.
Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, 7(1), 22–30. https://doi.org/10.21061/je.v7i1.a2
Hosseini, Z. (2009). Collaborative learning and critical thinking. *Journal of Developmental Psychology: Iranian Psychologists*, 5(19), 199–210. http://jip.azad.ac.ir/article_512345_8175a5f34debc4a32c1f51d7d4e265a.pdf
Ingleton, C., Doube, L., & Rogers, T. (2000). Leaps into collaborative learning. *LEAP archive series*. Centre for Learning and Professional Development (CLPD), University of Adelaide. http://www.adelaide.edu.au/cld/pdf/LeapsintoCollaborativeLearning.pdf
Jabbari, S. (2005). The effect of metacognitive reading through collaborative learning approach on the reading comprehension of late learning children. *Journal of Social and Human Sciences of Shiraz University*, 22(4), 82–93. http://ensani.ir/file/download/article/20110226101942.pdf
Jonassen, D. H., Beer, K., & Yacci, M. (1993). Structural knowledge: Techniques for representing, conveying, and acquiring structural knowledge. Lawrence Erlbaum Associates.
Jones, R. C. (2006). Strategies for teaching reading comprehension. http://www.readingquest-strat/graphic.html
Keshavarz, M. H., Atai, M. R., & MossahebiMohammadi, S. (2006). The effect of semantic mapping strategy instruction on vocabulary learning of intermediate EFL students. *Journal of Faculty of Letters and Humanities*, 49(198), 149–176. http://ensani.ir/file/download/article/20110215140622-5.PDF
Khamesan, A., & Baradaranhakasr, Z. (2011). Comparison between collaborative and individual concept mapping with the traditional method in teaching English. *Foreign Language Research Journal*, 11(1), 57–75. https://www.sid.ir/journal/ViewPaper.aspx?id=160631
Lantolf, J. P., & Poehner, M. E. (2008). Dynamic Assessment. In E. Shohamy & N. H. Hornberger (Eds.), *Encyclopedia of language and education* (Vol. 7, 2nd ed., pp. 273–284). Springer Science +Business Media, LLC.
Laufer, B. (1997). What’s in a word that makes it hard or easy? Some interlexical factors that affect the learning of words. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 140–155). Cambridge University Press.
McConnell, D. A., Steer, D. N., Owens, K. D., & Knight, C. C. (2005). How students think: Implications for learning in introductory geoscience courses. *Journal of Geoscience Education, 53*(4), 462–470. https://doi.org/10.5408/McConnell_v53p462

Mesratabi, J., FathiAzar, E., & Ostovar, N. (2005). The efficacy of the provision of pre-planned, individual and cooperative methods of preparing concept maps as an instructional strategy. *Quarterly Journal of Educational Innovations, 4*(13), 11–31. http://ensani.ir/file/download/article/20101214094838-2.pdf

Morgan, M. (2003). Welcome to exemplary practices in teaching. Retrieved April 22, 2013 from www.bridgew.edu/Library/CAGS_Projects/MMORGAN/web%20page/literature%20review.htm

Neisi, A., Nojarian, B., & Sheikhsani, M. (2004). Comparing the effect of cooperative learning and traditional teaching on the academic achievement, learning, progress motivation, and self conception of grade 7high school students of Bushehr. *Journal of Psychology and Educational Sciences, 11*(3–4), 25–44. https://www.sid.ir/irfa/viewPaper.aspx?id=11364

Onwuegbuzie, A. J. (2001). Relationship between peer orientation and achievement in cooperative learning-based research methodology courses. *The Journal of Educational Research, 94*(3), 164–170. https://doi.org/10.1080/002206701095999913

Rumelhart, D. E. (1980). Schemata: The building blocks of cognition. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 33–58). Erlbaum.

Saeidi, M., & Atmani, S. (2011). Teaching vocabulary through semantic mapping as a pre-reading activity across genders. *Journal of English Studies, Islamic Azad University, Science and Research Branch, 11*(1), 51–64. http://jes.srbiau.ac.ir/article_5621_3f1fc709c786a9f36e00d413b871c819.pdf

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics, 11*(2), 129–158. https://doi.org/10.1093/applin/11.2.129

Seif, A. (2007). Modern educational psychology. Doran Publication.

Singhal, M. (1998). A comparison of L1 and L2 reading: Cultural differences and schema. *The Internet TESL Journal, 4*(10). http://iteslj.org/Articles/Singhal-ReadingL1L2.html

Sirafi, N. (1995). The effect of cooperative learning on the academic achievement of the students [Unpublished MA thesis], Faculty of Psychology and Educational sciences, Allameh Tabatabai University.

Srinivas, H. (2010). Collaborative Learning. http://www.gdrc.org/kmgmt/c-learn/index.html

Stahl, S. A., & Vancil, S. J. (1986). Discussion is what makes semantic maps work in vocabulary instruction. *The Reading Teacher, 40*(1), 62–67. https://www.jstor.org/stable/20119930(s=1

Tateum, S. (2007). A case study of the implementation of semantic mapping as a pre-teaching vocabulary activity to 2nd year English major students at Lampang Rajabhat University. A research paper submitted in partial fulfillment of the requirements for the degree of Master of Arts in Teaching English as a Foreign Language. Language Institute, Thammasat University, Bangkok, Thailand.

Tinkham, T. (1993). The effect of semantic clustering on the learning of second language vocabulary. *System, 21*(3), 371–380. https://doi.org/10.1016/0346-251X(93)90027-E

Veezi, S. (2006). Theories of reading. http://www.teachinenglish.org.uk/think/articles/theories-reading.

Vakilifard, A., & Madani, R. (2002). Reading and comprehending Persian by foreign students. Parak Publications.

Vaughn, S., & Edmonds, M. (2006). Reading comprehension for older readers. *Intervention in School and Clinic, 41*(3), 131–137. https://doi.org/10.1177/1053451206041003101

Waring, R. (1997). The negative effects of learning words in semantic sets: A replication. *System, 25*(2), 261–274. https://doi.org/10.1016/S0346-251X(97)00013-4

Whicker, K. M., Bol, L., & Nunney, J. A. (1997). Cooperative learning in the secondary mathematics classroom. *The Journal of Educational Research, 91*(1), 42–48. https://doi.org/10.1080/00220679709599519

White, C. J. (1988). The role of associational patterns and semantic networks in vocabulary development. *English Teaching Forum, 26*(4), 9–12. https://books.google.com/books?id=HcrLqAAAMAAJ&pg=RA7–PA9&lpg=RA7–PA9&dq=The+role+of+associational+patterns+and+semantic+networks+in+vocabulary+development&source=bl&ots=oM57inhtx9&sig=ACfU3U1Q7BulgOtX6QoM22N6WcW6c7QA9Q&hl=en&sa=X&ved=2ahUKEwj5scHg4JzpAhVhrHEKHcJdCdMQ6AEwBHoECAQAg#v=onepage&q=The%20role%20of%20associational%20patterns%20and%20semantic%20networks%20in%20vocabulary%20development&f=false

Zohedi, Y., & Abdi, M. (2012). The effect of semantic mapping strategy on EFL learners’ vocabulary learning. *Procedia- Social and Behavioral Sciences, 69*, 2273–2280. https://doi.org/10.1016/j.sbspro.2012.12.198
