

Role of Teacher-Constructed vs. Cooperative Concept Map Learning Strategies in EFL Learners' Reading Comprehension and Autonomy

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Abstract

The purpose of this study was to investigate the impact of 2 concept map (CM) learning strategies on Iranian EFL learners' reading comprehension ability and learner autonomy. To this end, 60 Iranian EFL learners at the preintermediate level of language proficiency were randomly assigned to 2 groups. Both groups received an 8-week instruction: one through teacher-constructed and the other through cooperative concept map strategies. Participants also filled out a 38-item autonomy questionnaire and took a 40-item test of reading comprehension ability before and after the treatments. Results revealed that the cooperative group outperformed the other one on the test of reading comprehension. However, the analysis of the participants' perceptions of autonomy did not show any significant difference across the 2 groups. Findings suggest that CM learning strategies may make strategic learners who are meaning makers and learn how to learn, especially when they are working collaboratively.

Keywords: Cooperative Concept Map; Learner Autonomy; Reading Comprehension; Teacher-Constructed Concept Map

1. Introduction

The ability to read in an L2 is considered to be an essential skill for academic learners, and it paves the way for independent language learning (Dolehanty, 2008). Reader's responsibility is not just having oral proficiency, looking at graphic symbols from left to right and decoding the printed symbols on a page, but they are also expected to derive meaning from the written text (Novak & Gowin, 1984). The ability to comprehend the text is to create meaning (Pressley, 2000) which, in turn, requires readers to make connections between new and known information (Pearson, Roehler, Dole, & Duffy, 1992; Pressley, 2000). This perspective runs counter to rote learning where no effort is done for making this connection (Ausubel, 1968; Mintzes, Wandersee, & Novak, 2000). In addition, this

points to the interactive nature of reading where the reader reconstructs the author's intended meaning by activating previous knowledge (Grabe, 1991).

In line with its interactive nature, reading is believed to involve cognitive processes aimed at developing a plan (strategy) to help learners in comprehending when reading words does not provide meaning by itself (Pearson et al., 1992). Accordingly, instructing students explicitly in using strategies has been accorded prominence in L2 programs. Any strategy instruction including concept map (CM) learning strategy, in fact, can move learning from being rote to meaningful (Novak & Gowin, 1984). CM learning strategy helps learners organize information through visual aids (Liu, Chen, & Chang, 2010) and motivates them to find relationship between ideas (Novak & Gowin, 1984). In addition, it is not just a graphic organizer, but a way to connect the text to a student's current knowledge and experience.

Novak and Gowin (1984) indicate that students who use CM learning strategy can take charge of their learning more and move toward learner autonomy. They also state that "CM can foster cooperation between student and teacher (or child and school) in a battle in which the monster to be conquered is meaningless information and victory is shared meaning" (p. 23). Ellis (2004) points out that graphic organizers empower learners to become strategic and independent which is the ultimate goal of teaching. Owing to the increased cooperation required the use of CM learning strategy has made advocates of cooperative learning (Preszler, 2004; Vygotsky, 1978) accept that CM learning strategy enhances understanding by interaction among peers and brings success to their learning. The fact is that learners become more independent by learning from their peers (Jacob & Farrell, 2001) and according to Lowes and Target (1999), learners become more successful if they take responsibility for their own learning. When learners become autonomous, they learn how to learn which means becoming familiar with using appropriate strategies for their learning purposes (Kumaravadivelu, 2006).

Notwithstanding some illuminating and informative studies dealing with CM learning strategy and its effect on different language skills, such studies in our domestic situation are few and far between. Moreover, to the best of the researchers' knowledge, the possible role of CM learning strategy in promoting L2 learners' autonomy has remained untapped in Iranian EFL educational settings. Therefore, there seems to be a great deal yet to be done as to the application of CM learning strategy in EFL environments, especially for young learners at elementary or preintermediate level. EFL learners at the early stages of learning another language appear to be in need of developing their conceptualizing skills of the world around them, much of which being achieved through the language learning, be it the L1 or L2. Thus, learning how to deal with the concept maps and apply them in the language learning activities is very likely to increase the learners' learning an L2.

The present study as an attempt to account for this exigency addressed the differential impacts that teacher-constructed and cooperative CM learning strategies might have on L2 reading comprehension and also on the perceptions of learner autonomy of Iranian high school students learning English as an L2. The reason for examining the L2 learners' autonomy is that development of concept map skills is very closely associated with the degree of independence learners can acquire in handling their own learning situations (Hwang et al., 2011). Also, the study involved two conditions of student centered versus teacher controlled which seemed to be corresponding to a proper context where the learners could foster their own autonomous learning capacity (i.e., self-centeredness) compared with the context in which they had no chance of doing so (i.e., teacher-centeredness). In other words, young learners are expected to gradually relinquish their overreliance on the predetermined conditions and agents and grow into egocentric problem solvers. Consequently, the language learners in this study were provided with the opportunity for working under teachers' direction as well as their own collaborative concept making efforts, which are assumed to give rise to some differential outcomes as claimed in the available literature (e.g., Littlewood, 2000; Luftenegger et al., 2012; Vygotsky, 1978). Also, the researchers in this study decided to explore the learners' perceptions of autonomy rather than their actual behavior because learner autonomy is admittedly a long term endeavor and inherently requires a longitudinal investigation if its genuine and practical enhancement to be delved into. Thus, to exercise care and caution concerning such an issue which takes place over time and may not be amenable to a two-month instructional treatment, the researchers included the autonomy perception analysis in this study.

2. Literature Review

Tracing back to 1972, Novak and Gowin applied the CM learning strategy in their research to assess children's understanding of conceptual changes over time (Novak & Gowin, 1984), and CM learning strategy was introduced as not only a simple arrangement of ideas in hierarchy but a complex picture of one's thinking (Novak & Canas, 2007).

The best learning theory that supports the CM learning strategy is Ausubel's assimilation theory whose primary concept is meaningful learning through relating new knowledge to the preexisting knowledge of the learner (Ausubel, 1968; Ausubel, Novak, & Hanesian, 1978). Moreover, CM learning strategy gains support from the major tenets of information processing theory. It can mirror the type of network structure in this theory because the connections among concepts which are shown by graphical representation assist learners in retaining and elaborating information in a meaningful way (Zimmaro & Cawley, 1998). In the same line, Novak and Gowin (1984) state that humans have poor memory in

remembering details, but they have wonderful capacity for recalling specific visual images. They even clarify it more by giving such an example that “we can easily recognize our close friends in a gathering of hundreds or in a photograph of a group” (Novak & Gowin, 1984, p. 28).

A wealth of studies regarding CM learning strategy has been conducted in educational settings: Four approaches such as teacher-constructed, learner-constructed, fill in the map, and cooperative concept map are widely used in EFL classrooms. Teacher-constructed and cooperative concept map as the concern of this research are introduced in this way: Teacher-constructed, or expert-constructed map, is the one which is prepared by the teacher before coming to class on the topic to serve as a guide or scaffold in learning (Novak & Canas, 2007). This map reduces holding misconceptions by the learners (Novak, 2002), helps them in comprehension of a text, and saves teachers time (Hall, 1988, as cited in Liu, Chen, & Chang, 2010; Jonassen, Beissner, & Yacci, 1993). Cooperative concept map is drawn and completed in groups and cause better learning (Novak & Canas, 2007). This approach has been developed from social development theory of Vygotsky (1978) which emphasizes the fundamental role of social interaction in the process of cognitive development and finally leads to student’s independent problem solving. The related literature reveals that cooperative concept maps are beneficial in improving social communication skills, and learning motivation (Guveng & Acikgoz, 2007; Hwang, Shi, & Chu, 2011; Kwon & Cifuentes, 2009; Liu, Chen, & Chang, 2010). CM learning strategy, as an advance organiser, connects the prior concepts that learners know and provides a structure into which the new concepts can be integrated (Novak & Gowin, 1984; Willerman & Mac Harg, 1991). It can also be used as an assessment tool in formative and summative assessment procedures (Mintzes, Wandersee, & Novak, 2000).

Adopting the CM learning strategy in reading, scholars investigated its influence on enhancing comprehension, summerization, and other possible advantages of this learning strategy by linking the relationship of the concepts (Chang, Sung, & Chen, 2002; Dias, 2010; Soleimani & Nabizade, 2012). Liu, Chen, and Chang (2010) showed the CM learning strategy benefits for the low-level group more than the high-level group. However, Wu and Zeng (2003) suggest that CM learning strategy is more helpful for L2 learners with high level of proficiency than for those with low proficiency level in reading comprehension.

On the other hand, Dolehanty’s (2008) found out that CM learning strategy had no significant effect on L2 learner’s reading comprehension ability, but students reported positive attitudes toward using CM learning strategy. Further, different types of CM learning strategy have been widely reported to be used in such hard

sciences as biology, physics, and chemistry (Boujaoude & Attieh, 2007; Chang, Sung, & Chen, 2001; Francisco, Nicoll, & Trautmann, 1998; Pankratius, 1990).

Positive interdependence and accountability are two key concepts to cooperative learning (Johnson & Johnson, 1994; Luftenegger et al., 2012) which cause students move from other-directed to self-directed stages which are facilitated by the teacher by relinquishing the assistance provided (Dam, 1995; Vygotsky, 1978; Wells, 1999). In a collaborative environment, Lefever (2005) provided learners with the opportunity to learn on their own by selecting topics, deciding on their homework, and final presentation. His findings lend support to the positive effects such strategies have and the creativity and productivity they brought to L2 classrooms.

In EFL contexts, the majority of EFL learners read the text word by word using translation procedure (Robb & Susser, 1989). While encountering a new word, they consult the dictionary for the meaning of the word which is a time-consuming activity. This reading behavior not only slows down their reading speeds, but also hinders their reading comprehension. In addition, their comprehension is measured by teaching traditional reading skills such as skimming, scanning, and inferencing. They are hardly familiar with the idea of constructing meaning from the text by using their prior knowledge. Moving from traditional reading program which was teaching reading skills toward comprehension strategies which emphasize the role of strategies, prior knowledge, experience, and its connection with new knowledge will cause confusion for learners especially young EFL learners. Considering little communication with and contribution to the society, such reading activities and behavior have made it a difficult task for young learners to relate current information to their individual experience (Dolehanty, 2008). Moreover, many students are unaware of such strategies or use inappropriate strategies, due to lack of strategy knowledge and limited time for reading instruction in classes (Dreyer & Nel, 2003).

By using strategies, learners are expected to move from being receptive to autonomous discoverer learners (Novak & Gowin, 1984) and can be responsible for their own learning and those with whom they interact, thus developing their autonomy (Jacob & Farrell, 2001). However, for promoting cooperation, the appropriate atmosphere should be fostered (Sapon-Shevin, 1999, as cited in Jacob & Farrell, 2001) which is problematic in an EFL environment where the teacher is seen as the authority and the active role of the learner has been ignored (Littlewood, 2000). In spite of several informative studies on the functions of strategy instruction in L2 learning processes, few studies have so far been implemented on the role of CM learning strategies in developing L2 learners' autonomy. Therefore, the current study investigates the effect of explicit teaching of CM learning strategy through two of its approaches (i.e., teacher-constructed CM and cooperative CM) on reading

comprehension and learner autonomy. Accordingly, the following research questions are addressed in this study.

1. Do teacher-constructed CM and cooperative CM strategies affect L2 learners' reading comprehension ability differently?
2. Do teacher-constructed CM and cooperative CM strategies promote L2 learners' autonomy differently?

3. Method

3.1 Participants

The participants were 60 female students studying English at an institute for 3 years in Mashad, Iran. Their age ranged from 14 to 16. All the participants had taken a version of the Oxford Placement Test (OPT; 010) to determine their level of language proficiency. The test, a 60 item test, served the placement purpose in this research. The OPT is claimed to provide satisfactory indexes for placement. It is, in fact, a commonly used test in SLA studies. Based on the results, the participants were all at the preintermediate level of English proficiency (obtaining 29 to 34 out of 60).

3.2 Instrumentation

3.2.1 Reading comprehension test

The reading comprehension test was taken from TOEFL (2010) reading comprehension test for the preintermediate level to check their level of reading comprehension for the purpose of the study. It consisted of 40 multiple-choice items and was administered as a pretest before the treatment and as a posttest after the treatment was over. Regarding the reliability estimate, the result of running Cronbach's coefficient for the test showed 0.78, pointing to an acceptable reliability level. The validity of the test was judged by two experts who were university professors and had long-time experiences of teaching English and researching the related issues in applied linguistics. Their comments and revisions were implemented in the final version of the test.

3.3.2 Learner autonomy questionnaire

The learner autonomy questionnaire was the one developed by Zarei and Alibabaei (2013, see Appendix). The questionnaire was designed based on the conceptualization of Luftenegger et al. (2012). The questionnaire contained scales on different aspects of autonomy. Because the questionnaire was designed for university students, some of its items were restated to be comprehensible for the participants. Then, the restated items were evaluated by two experts to keep its original concepts. Regarding the reliability estimate, Cronbach's coefficient for the scale was 0.72. The validity of the questionnaire had already been evaluated by the

two authors (Zarei & Alibabae, 2013). For the purpose of this study, the content validity was reevaluated by two university professors. The posttreatment questionnaire items were converted to a retrospective form through the change of the tenses when used after the treatment.

3.3 Procedure

3.3.1 Data collection

With homogeneity in the learners' general English proficiency level established, all the 60 participants were randomly assigned to two experimental groups, 30 in each. The teacher-constructed CM group was arranged to receive CMs constructed by the teacher, and the cooperative CM group constructed CMs in groups of three and four. The participants were required to take the reading comprehension pretest and fill out the learner autonomy questionnaire. They took the same reading comprehension test as the posttest and filled out the questionnaire after the treatment.

Before starting the treatment, the instructor was provided with handouts about CM based on Novak and Gowin (1984). The handouts included an introduction to CM, its characteristics, its advantages, ways of its construction, and steps of teaching it to students according to their levels of language proficiency. Luckily, the instructor was somehow familiar with the strategy, and this facilitated doing the current study. In the next step, the participants in the two groups were introduced to the strategy for three 60-min sessions separately. The instructor told the participants in both groups that they would be learning a strategy that could help them read easier. They were introduced to the concepts and the relationships between the concepts in their mind and what is outside in the world according to the instructional steps in Novak and Gowin (1984). By providing these three preparing sessions, the participants became familiar with constructing a map. The instructional sequence targeted the following steps which were designed for seven-graders through college students (Novak & Gowin, 1984).

In the first step, the instructor made two lists of words on the blackboard using a list of familiar words for objects and another list for events. For example, object words were *car, dog, chair, tree, cloud, book*, and event words were *raining, playing, washing, thinking, thunder, and birthday party*. Then, the participants were asked if they could describe how the two lists differed. The desirable answer was that the first group listed things or objects and the second list referred to happenings or events.

In the second step, in order to introduce the word *concept*, the participants were asked to describe what they thought of when they heard the word *car, dog*, and so on. Then, the activities were repeated with event words. Again, the teacher

pointed out the differences in individual's mental images, or concept, of events. In the third step, the teacher listed words such as *are, where, the, is, then, with,* and asked the participants what came to their minds when they heard each of these words. These words were introduced as linking words.

In the fourth step, proper nouns were introduced as the names of specific people, events, places, or objects. Following that, some examples were provided to clarify the distinction between labels of regularities in events or objects and those for specific events or objects (i.e., proper nouns). Then, the instructor constructed a few short sentences on the board to illustrate how concept words plus linking words were used by humans to convey meanings. Examples were *The dog is running,* or *There are clouds and thunder.* Next, the participants were asked to construct a few short sentences of their own, identify the concept words, and tell whether each is an object or event, as well as identify the linking words.

In the next step, the instructor made copies of some passages and asked the participants to read the passages and identify key concepts. Also, they were asked to find some linking words and concept words that were less important in the passage. The concepts were written on the board. The instructor discussed with the participants about the most general and the most specific concepts. Meanwhile, constructing a CM started. The participants were asked to help in making a hierarchy, and cross-links by linking the concepts in different parts of the map and choosing the linking words for the cross-links. Finally, the participants in cooperative CM were asked to make their own CMs on three selected passages and presented them to the class.

Because the participants had to cover other parts of the book such as grammar, one hr in each session, twice a week, was devoted to the instructional treatment in L2 reading. The participants worked on the reading section of each chapter of the book *New Interchange 1* (unit 1-8), which is prepared for preintermediate students. The passages were each 220 to 250 words in length. During the treatment, the teacher-constructed group received instructor's map, and the cooperative group constructed their own map in groups. To ensure that the same conditions were provided for both groups, the materials, the instructor, and the time devoted to strategy instruction for each group were the same. At the end of the treatment, the reading comprehension as the posttest and autonomy questionnaire were administered. The participants' scores from the reading comprehension pre and posttests as well as from the learner autonomy questionnaire before and after the treatment made up the required data for analysis in this study.

3.3.2 Data analysis

The reading comprehension test consisted of 40 multiple-choice items selected from *TOEFL Practice Tests for the Preintermediate Level*. Regarding the scoring procedure, a correct answer would count as “one point,” and each incorrect/no response would count as “zero.” Therefore, the maximum score for each participant was 40 on the reading comprehension test. The participants’ responses on the learner autonomy questionnaire were scored using a 5e-point Likert type scale: 1 (*Absolutely Disagree*), 2 (*Disagree*), 3 (*No Idea*), 4 (*Agree*), and 5 (*Absolutely Agree*). The scale scores were determined by summing the items for each participant. Therefore, the maximum score for each participant’s perception of learner autonomy was 190 from the 38 items on the learner autonomy questionnaire.

The data were analyzed through SPSS in terms of mean score differences and their corresponding *p* values by running paired sample *t* tests and independent samples *t* tests for the two experimental groups. The results are elaborated in detail in two parts (i.e., the reading comprehension and learner autonomy) in the following section.

4. Results

To ensure that both groups were initially at the same level of English reading comprehension ability, the participants’ performance on the pretest was analyzed through descriptive and inferential statistics. The results are presented in Table 1:

Table 1. *Descriptive and Inferential Results for the Performances of the Groups on RC Test*

	Teacher-Constructed CM	Cooperative-Constructed CM	Independent <i>t</i> test		
			<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
Pretest	<i>M</i> : 26.65 <i>SD</i> : 3.16	<i>M</i> : 25.43 <i>SD</i> : 3.52	.000	58	0.98
Posttest	<i>M</i> : 33.70 <i>SD</i> : 2.49	<i>M</i> : 36.63 <i>SD</i> : 1.88	5.141	58	.000
Paired <i>t</i> test	<i>t</i> : -10.63 <i>df</i> : 29 <i>Sig.</i> : .000	<i>t</i> : -13.92 <i>df</i> : 29 <i>Sig.</i> : .000			

M = Mean
SD = Standard Deviation

As presented in Table 1, there was not any noticeable difference between teacher-constructed and cooperative groups’s mean scores (i.e., 26.65 and 25.43, respectively). And, there was not much difference in the standard deviations of the groups either (i.e., 3.16 and 3.52, respectively). As evident from Table 1, no

significant difference was found between the two groups' pretest scores on the reading comprehension ($t = .000$, $Sig. = 0.98$). This indicates that the participants in the teacher-constructed and cooperative CM learning strategy groups did not differ significantly on the pretest scores of the reading comprehension.

Moreover, the performance of the participants in the teacher-constructed group was much higher on the posttest (33.70) than on the pretest (26.65). The results of running a t test revealed that there was a statistically significant difference between the mean scores of the pre and posttests of the teacher-constructed group on the reading comprehension ($t = -10.63$, $Sig. = .000$). The data analysis revealed similar results for the cooperative CM group. The results showed a higher performance on the posttest (36.63) than on the pretest (25.43). The t -test results showed a statistically significant difference between the pre and posttest performance in the cooperative CM group ($t = -13.925$, $Sig. = .000$).

Regarding the comparison between the two groups, the participants' performance in the cooperative group was better than the performance in the teacher-constructed group (i.e., 6.63, and 33.70, respectively). Further, the results of performing an independent samples t test indicated that the cooperative group outperformed the teacher-constructed group on the posttest ($t = 5.141$, $Sig. = .000$). This implies that CM learning strategy was beneficial for reading comprehension, especially when it was implemented cooperatively.

As to the second dependent variable in this study, the results of the analysis of the participants' perceptions of learner autonomy in the two groups before and after the treatments are reported in Table 2:

Table 2. *Descriptive and Inferential Results for the Groups' Perception of Autonomy*

	Teacher-Constructed CM	Cooperative-Constructed CM	Independent t test		
			t	df	$Sig.$ (2-tailed)
Pretest	$M: 132$ $SD: 32.28$	$M: 138.20$ $SD: 28.79$	-.785	58	.436
Posttest	$M: 142.36$ $SD: 28.44$	$M: 148.46$ $SD: 26.68$	-.857	58	.395
Paired t test	$t: -1.983$ $df: 29$ $Sig.: .057$	$t: -1.200$ $df: 29$ $Sig.: .240$			

M = Mean
 SD = Standard Deviation

According to Table 2, the results of performing an independent samples t test indicated that there had was not any significant difference between the

participants' perceptions of autonomy in the two groups ($t = -.785$, $Sig. = .436$). This revealed that the two groups were at the same level of learner autonomy at the beginning of the experiment. The results of comparing the perceptions before and after the treatment showed that in spite of the increase in the mean scores, the t-test results indicated no significant differences between the two groups after receiving the treatment ($t = -.857$, $Sig. = 0.395$). Also, comparing the perceptions of autonomy before and after the treatment in each group did not show any significant difference ($t = -1.983$, $Sig. = .057$ for teacher-constructed CM, and $t = -1.200$, $Sig. = .240$ for cooperative-constructed CM).

All in all, although both types of CM strategies improved the EFL learners' reading comprehension abilities, the group receiving the cooperative CM learning strategy outperformed the other group. Regarding the effect of CM learning strategy instruction on the participants' perceptions of learner autonomy, neither teacher constructed nor cooperative-constructed CM learning strategy could improve the participants' perceptions significantly, even though their mean scores on the questionnaire had increased.

5. Discussion

The results of the data analysis demonstrated that CM learning strategy within its two approaches can enhance reading comprehension significantly, but it cannot bring about significant promotion as far as autonomy is concerned. Both experimental groups obtained statistically significant higher mean scores on their reading comprehension posttests. This indicates the direct influence of explicit teaching of CM learning strategy on the learners' reading comprehension. As for the enhanced reading comprehension ability of the participants, the results are consistent with those of other similar research showing that CM learning strategy is effective in boosting students' reading comprehension as well as some associated activities such as developing students' ability for summaries, enlarging their vocabularies, reviewing for an exam, and using other types of strategies (e.g., Chang, Sung, & Chen, 2002; Dias, 2010; Liu, Chen, & Chang, 2010; Soleimani & Nabizade, 2012).

There are several possible explanations for the positive effects of CM learning strategy in this study. First, efficient reading requires comprehension (Durkin, 1993; Pressley, 2000) that is obtained by meaningful learning against the backdrop of background knowledge (Ausubel, 1968). This highlights the role of subsumption in which the new knowledge relates to the preexisting one in the learner's cognitive structure and makes learning meaningful (Ausubel, 1968). As new material enters into cognitive structure of the learner, it is subsumed under a more general conceptual system to promote associations with prior knowledge (Ausubel, 1968). That is why the learners performed better on the posttest and managed to expand the CM learning strategy during the experiment.

According to the instructor's observations in the present study, at the beginning of the study, the cooperative group which was going to draw the maps in the groups made simpler maps usually with fewer nodes, but after passing some sessions, they were able to develop their maps into the more complex ones. Even, the teacher-constructed group that received the teacher's maps were motivated to construct them by themselves and asked the instructor to let them work on their own. Both groups answered the comprehension questions better even from the first sessions of applying the strategy. These observations may point to the L2 learners' use of prior knowledge because CM learning strategy construction requires activating background knowledge (Novak & Gowin, 1984), which is the basis of meaningful learning as an important goal in education (Ausubel, 1968).

Second, CM learning strategy requires learners to assume an active role in learning by extracting ideas of the text, thinking about their relations, and organizing the information into hierarchies, chains, and clusters (De Simon, 2007). When students read a text and construct a CM, important and main information is highlighted in their minds, so details will be remembered easily. This emphasizes the CM relations with the information processing theory because the connections among the concepts which are shown by graphical representation assist learners in retaining and elaborating information in a meaningful way (Zimmaro & Cawley, 1998). This is in line with Novak and Gowin's (1984) claim that humans have poor memory in remembering details, but they have a wonderful capacity to recall specific visual images. Perhaps, that is why the participants answered the comprehension questions more quickly after applying the strategy. As they mentioned, there was no need to refer back to the text to answer each question.

As evidenced by the instructor's observations, the participants were more engaged in reading after applying the strategies because they could be motivated to read for meaning (Wang & Guthrie, 2004). As the third explanation, CM learning strategy affects students' attitudes; as a result, it enhances their motivation because of success in creating CM and getting rid of rigid routines making them inactive in their English learning activities. This is to stress the significance of meaningful learning which could also induce impetus for further learning (Lambert et al., 2002).

It appears that CM learning strategy, as a metacognitive strategy, is effective in reading comprehension as learners evaluate and monitor their own learning outcomes. Besides, those who are equipped with strategies are more successful in monitoring their learning in comparison with those who do not have any strategic information. The strategic awareness and monitoring of the comprehension process are vital aspects of proficient reading which refer to metacognition as the knowledge of reader's cognition dealing with the process of reading and mechanisms they use to monitor and enhance comprehension (Sheorey

& Mokhtari, 2001). As such, monitoring learning through CM resulted in better comprehension and thus higher posttest mean scores. This result concurs with the findings of Mintzes, Wandersee, and Novak (2000). We can claim that CM instruction can help novice readers to develop into expert readers who can be consciously aware of their cognition and consequently they can monitor and regulate their own comprehension; therefore, they know how and when to use strategies to successfully answer comprehension questions, (Pearson et al., 1992).

The analysis revealed better significant performance on the part of the cooperative group compared with the teacher-constructed group, meaning that the application of cooperative CM helped the participants to perform better than those being taught by the teacher's maps. Obtaining statistically significant mean scores by the cooperative group supports the advantages of cooperative learning which is learning from each other through imitation and experience (Preszler, 2004; Vygotsky, 1978). The instructor's observations confirmed the idea by reporting that the students were faster in answering comprehension questions in the cooperative group and made fewer mistakes compared with the teacher-constructed group. The teacher also spent less time to give them feedback in comparison with the other group. The students in the cooperative group benefited from peer-correction which emphasizes interaction with peers and learning from them to be successful (Lowes & Target, 1999).

Harmer (1998) states that group work makes greater interdependence because learners work together without being controlled in every move, have choice on their learning and the way of doing a certain task, work without the pressure of being listened by the whole class, and decisions and responsibilities are shared. It is collaborative interaction that makes learners adjust to each other at their stage of development (Vygotsky, 1978). In this study, the teacher-constructed group enhanced cooperation with their teacher, but the students' interaction with the instructor were slightly lower than those with the peers in the cooperative group because the students spent most of the time with their peers in the cooperative learning environment, enjoyed the interactions in cooperative learning, and reported that they felt more relaxed and active in the job. Also, the teacher was more satisfied with the cooperative learning activities than the teacher-constructed group.

Despite the significant differences discovered between the two groups in relation to reading comprehension, CM learning strategy instruction did not show any remarkable differences on learner autonomy. The groups' marginally higher mean scores on autonomy questionnaire after the treatment in comparison with the one before the treatment can suggest a narrow positive influence of CM learning strategy instruction on the participants' perceptions of learner autonomy as some scholars point out that applying strategies by students leads them to independent

learning (Ellis, 2004; Mintzes, Wandersee, & Novak, 2000; Novak & Gowin, 1984). Having said that, the nonstatistically significant results on learner autonomy in this study, in spite of the direct influence recommended by other studies, have their own justification: Learner autonomy is considered as a change in mind, and this event may not be achieved in a two-month experiment. Students need psychological and methodological preparation to accept autonomy, and it needs a lot of negotiation, trial, and error which are done by letting go of control and having faith in learners' abilities to take charge of learning (Seeman & Tavares, 2000). To be autonomous, learners need to have options. As a process, autonomy is a capacity that has to be learnt; it involves a change in power relationship which means moving from teaching to learning (Little, 2000).

Moreover, knowing how to work on learning strategy and thus promoting autonomy is not something learners automatically know to achieve; they need a lot of practice (Lacey, 2007). That is, to achieve the goal regarding L2 learners' perceptions of learner autonomy necessitates further research on how to implement autonomy in the Iranian EFL context, where the teacher is traditionally accepted as the authority, not the facilitator and counselor in the class.

Yet, the cooperative group's marginal outperformance on autonomy perception can also be explained as follows. Such superiority lies in one of the foundations of learner autonomy that is to be captured through group work (Little, 2000). Group work is an essential aspect of a learner autonomous classroom. By shifting the focus from teaching to learning and diminishing learners' dependence on the teacher, the way is paved for peer assistance (Lacey, 2007). This was revealed in the cooperative group because the teacher had to relinquish power to the learners in comparison with the teacher-constructed group. It appeared that at any particular time, the learners were able to perform some tasks by themselves but needed the help of others, meaning that learners support each other from the beginning of the task performance in the way to build the complex structure of interdependence (Little, 2000).

6. Conclusion

This study aimed at finding the impact of CM learning strategy through two of its approaches on reading comprehension and autonomy. The findings revealed that CM had a direct influence on reading comprehension with the superiority of the cooperative group. However, it did not have any significant effect on learner autonomy. The results have implications for EFL pedagogy in the Iranian educational setting. First, the findings suggest that explicit teaching of strategies should not be left apart in the EFL context due to the lack of strategic knowledge and instruction time in classes (Dreyer & Nel, 2003) and the inappropriate teacher-centered atmosphere which is troublesome in EFL contexts (Littlewood, 2000).

Teachers can make use of this strategy to for summarizing the text, learning novel vocabularies, understanding literary works, as well as writing. Textbook writers, syllabus designers, and curriculum developers can add CM exercises to students' books in reading and writing section. As a very useful implication, CM can be used as an assessment tool in assessing students' understanding in exams, especially for other subjects such as science (in some schools, science and math are being taught in English such as Sama School in Mashad). Second, because teachers play an important role in students' learning, it is vital to have training programs for them to be able to raise strategic learners and consequently autonomous ones.

Although this study elaborated on the effectiveness of CM learning strategy, there were some limitations that should be addressed. The first one was the sample size which made the results not generalizable to all Iranian EFL students. With a large and representative sample, the results would be more accurate. The next limitation was the matter of time which might have reduced the effectiveness of the experiment. Successful mastering of CM and enhancing learner autonomy require a long-time practice, trial and error, and instructors' guidance. This could have resulted in desired performance, even in learner autonomy if studied over time. The quantitative nature of the study is considered as another limitation. Think aloud protocols can be used by researchers to examine what happens in learners' cognition and metacognition when constructing CMs. Also, a further study may use CM as an assessment tool to assess learners' understanding. Other studies can apply CM in other contexts such as in ESP contexts in which learners have severe problems with comprehending texts written in L2. Moreover, further studies can be performed to investigate CM impacts on comprehension of different types of texts. The last recommendation can require technology based CM instruction and its impacts on reading and autonomy, which is a rarity in the Iranian EFL context.

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Appendix Learner Autonomy Questionnaire (Zarei & Alibabae, 2013)

مقطع تحصیلی:

جنسیت:

سن:

لطفا موضوعات زیر را به دقت خوانده و نظر خود را بر اساس مقیاس داده شده بیان کنید.

بسیار مخالف	بسیار موافقم	مخالقم	مخالقم ندارم	نظری ندارم	موافقم	بسیار موافقم
						۱ در این کلاس، من موضوعی را که فکر می کنم مهم است فراموش می کنم.
						۲ در این کلاس، احساس می کنم مهارت های مهم زبانی را کسب می نمایم.
						۳ در این کلاس، می توانم به برنامه ریزی فعالیتهای درسی بپردازم و موفق شوم.
						۴ در این کلاس، من تصور می کنم به هدفم میرسم.
						۵ در این کلاس، ما روند یادگیری هم را چک میکنیم.
						۶ در این کلاس، با تلاش می توانم از عهده مسائل پیچیده بر آیم.
						۷ در این کلاس، از روشهای متنوع برای یادگیری بهره می گیریم.
						۸ در این کلاس، ما از میزان موفقیت و پیشرفت خود آگاه میشویم.

				۹	در این کلاس، من فکر می‌کنم روشهایی را که برای یادگیری دنبال می‌کنم بسیار موثرند.
				۱۰	در این کلاس، ما مجموعه فعالیت‌های خود را بررسی میکنیم.
				۱۱	در این کلاس، من می‌خواهم آنچه را معلم می‌آموزد واقعا یاد بگیرم.
				۱۲	در این کلاس، من فعالیت‌های خود را با همکلاسی‌هایم در میان می‌گذارم.
				۱۳	در این کلاس، من سعی می‌کنم بهترین روش را برای حل هر مسئله انتخاب و به کار بگیرم.
				۱۴	در این کلاس، ما به کمک معلم در باره یادگیری موضوعات مختلف تصمیم‌گیری می‌نماییم.
				۱۵	در این کلاس، من اعتقاد دارم در انجام وظایف موفق می‌شوم.
				۱۶	در این کلاس، من نظراتم را در مورد مواد آموزشی و چگونگی یادگیری آن اعلام میکنم.
				۱۷	در این کلاس، من اعتقاد دارم نظم و ترتیب موجود نقش مهمی در پیشبرد امور دارد.
				۱۸	در این کلاس، ما در انجام تکالیف درسی به همدیگر کمک می‌کنیم.
				۱۹	در این کلاس، من اطلاعات موجود در کتاب را با چیزهایی که میدانم ترکیب کرده تا بهتر بیاموزم.
				۲۰	در این کلاس، ما می‌توانیم فعالیتها را تقسیم کرده و سپس آنها را به صورت کامل ارایه دهیم.
				۲۱	در این کلاس، من همواره ضعف‌های خودم را تحت نظر قرار می‌دهم.
				۲۲	در این کلاس، ما به کمک معلم اهداف یادگیری را تعیین و پیگیری میکنیم.
				۲۳	در این کلاس، من نقاط ضعف خودم را برای یادگیری عملی دروس کاهش میدهم.
				۲۴	در این کلاس، من می‌توانم به وظایف مورد علاقه شخصی خود بپردازم.
				۲۵	در این کلاس، من معتقدم مطالبی که می‌آموزیم منجر به موفقیت‌مان میشود.
				۲۶	در این کلاس، ما با همکاری معلم به نکات مثبت و منفی کارهای خود آگاه میشویم.
				۲۷	در این کلاس، من از دانسته‌هایم جهت استفاده بهتر در زمینه‌ی تحصیلیم استفاده میکنم.
				۲۸	در این کلاس، من اعتقاد راسخ دارم که خواستن توانستن است به خوبی صرف می‌شود.
				۲۹	در این کلاس، من سعی میکنم نه فقط از معلم بلکه از همکلاسی‌هایم نیز یاد بگیرم.
				۳۰	در این کلاس، من پیشرفت خود را با همکلاسی‌هایم مقایسه می‌نمایم.
				۳۱	در این کلاس، من با تمرکز بر مطالب ارائه شده، دانش و اطلاعات خود را گسترش می‌دهم.
				۳۲	در این کلاس، من از میزان پیشرفت خود آگاهم.

					در این کلاس، من به کمک دوستان روشهای مختلفی را برای حل مسائل به کار میبرم.	۳۳
					در این کلاس، من روند یادگیری خود را در هر درس مورد بررسی و ارزیابی قرار میدهم.	۳۴
					در این کلاس، من فعالیتهای مفیدی انجام می دهم که در رسیدن به هدفم مرا کمک میکنند.	۳۵
					در این کلاس، من یقین دارم در پیشبرد اهداف تعیین شده موثر هستم.	۳۶
					در این کلاس، فکر می کنم توان علمی خود را افزایش می دهم.	۳۷
					در این کلاس، من از روند پیشرفت تحصیلم آگاهم.	۳۸