The Effect of Semantic Mapping and Question Generation Teaching Strategies on English as a Second Language Tertiary Students' Reading achievement

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Abstract
This study aimed at investigating the effect of two strategies of teaching reading: 'semantic mapping' and 'question generation' on the reading achievement of a sample of 40 female students enrolling in two classes in Level 2 English as a Second Language Foundation Program at the Community College of Qatar. The researcher of the current study tried to find ways to help solve the problems of students' low achievement in reading comprehension tests. Convenient sampling was used to select the two classes as the researcher herself was teaching them. The two classes of 20 students each constituted two experimental groups. One class was taught by the semantic mapping strategy, and the other was taught by students' question-generation strategy. A pre-posttests design was used in both experimental groups. T-test computed on the pretests in both classes revealed that the groups were equivalent. The researcher established the validity and reliability of all the components of the study: the pre-posttest and the instructional material. The instructional material selected for the intervention consisted of four extra expository texts, which are not written in students' textbooks. After analyzing students' results on the pre-post tests using two T-Test statistical analyses, it was found out that there were significant differences in the mean scores of each group on the pre-post tests, which reveals that each individual strategy has significantly influenced the group achievement. In order to investigate which teaching strategy was significantly better than the other was a third T-test on the post-tests, mean scores in both groups were computed. The results were in favor of the experimental group, which was taught by the Semantic Mapping Strategy. In light of these findings, the researcher suggested several recommendations directed to ESL instructors, curricula designers, and researchers
Keywords: Semantic Maps, Question Generation, Foundation Level, EFL students, Community College of Qatar

Introduction
In this rapidly-changing world," the challenge of teaching is to help students develop skills which will not become obsolete" (Clouston, 1997, p.1). Successful readers are always referred to as active learners who engage in metacognitive activities which include planning before reading, monitoring and understanding through reading and checking outcomes after reading (Palinesar and Brown, 1985)

Derivation of meaning from the reading text is a fundamental task in any reading. The reader must learn how to adapt reading behavior to specific tasks. Central to the cognitive approach in teaching English as a second language is activating learners' ability to generate questions on the text, which helps them to utilize various thinking skills.

On the other hand, constructing meaning in a written text is based on understanding the relationship between the main ideas and the sub-ideas of written discourse. In the current study, pedagogical interventions were conducted in two classes to investigate which cognitive strategy is better for enhancing comprehension. These strategies were semantic mapping and students' question generation.

The theoretical background of the study
Second language learning-teaching process has passed through several dramatic changes in paradigms, theories, and practices that determine the way reading is perceived. Grabe and Stroller (2001) remarked that in such a century as the 21st, training readers to be good comprehenders, goal-oriented, and strategic is the crucial purpose of teaching reading. In order to produce such readers, there should be certain teaching strategies that help students to construct meaning in a reading text, to be able to utilize higher thinking strategies, and to make use of all the mental, social, visual aids to build their autonomy in learning.

Cognitive psychology paved the way for what is so-called "comprehension revolution" (Pearson, 1985), which stressed new trends in learning and the role of learners. Here, the learner is perceived as a person who can use his mental activities to construct meaning, make inferences, generate questions, analyze the text into its main ideas and sub-ideas and control his/her learning strategies. Researchers such as Wenden and Rubin (1987) stated that the ability of students to generate questions on the reading text is considered a basic cognitive strategy that characterizes successful readers. Paterno (2000) proposed other critical reading strategies. They included questioning about the context for understanding and remembering, outlining, identifying, and summarizing the main ideas and restating them in one's own words. Roberts and Erdos (1993) emphasized the idea that metacognitive strategies may overlap in that the same strategy, such as questioning, could be regarded as either a cognitive or a metacognitive strategy depending on what the purpose for using that strategy may be.

Grabe and Stoller (2001) reported that strategic readers make use of wide repertoire of strategies in combination rather than in separated applications. They are previewing a text, predicting what will come later in a text, summarizing, learning new words through the analysis of word stems and affixes, using context to maintain comprehension, recognizing text

organization, generating appropriate questions about the text, clarifying text meaning, and repairing miscomprehension.

Question-generation reading strategy

One of the reading strategies that is said to be a combination of cognitive and metacognitive skills is Question Generation. It is a crucial comprehension-fostering and self-regulatory cognitive strategy (Palincsar & Brown, 1985). The act of composing questions focuses the students' attention on content. It involves concentrating on main ideas while checking to see if the content is understood. Garcia and Pearson (1990) suggested that 'question generation' is one component of teaching students to carry out higher-level cognitive functions for themselves. When students generate questions about what they have read, they are actively processing text information and monitoring their understanding of that information. As a result, their text comprehension improves. Question-Generation reading strategy has roots in the interactive generative model of processing a written text. Wittrock (1991) stated that the generative model of teaching reading comprehension and the learning of the types of relations that learners must construct between stored knowledge and new information for comprehension are essential for understanding to occur.

Wittrock (1991) concluded that successful teaching of the generative processes attends to three factors: preconceptions, knowledge, and student perceptions. He added that it is essential to change students' perceptions of their roles in learning from recording and memorizing information to generating understanding by relating concepts to their experiences and their knowledge base. Wittrock (1991) also stated the practical ways to stimulate Generation. They include discussing the titles and headings, predicting information after analyzing them, writing summaries, stating objectives, creating own questions, drawing graphs, preparing tables, and constructing main ideas. What Wittrock (1991) stressed is the idea that an interactive approach recognizes the importance of both the text and reader in the reading process. According to Brisk and Harrington (2000), the question-generation strategy will "facilitate reading comprehension and foster recall by walking students through the steps of the reading process: stimulating background knowledge, predicting, actual reading, and synthesizing" p.62. First, the subject matter of the reading is presented to the students to provide information, teach essential vocabulary explicitly, and allow students to make connections to what they already know.

The students then write questions about the subject matter. Students can brainstorm the questions as a class, in pairs, or independently. The next step of the strategy involves the students guessing the answers to the questions. After completing these pre-reading activities, students receive the text to read. The actual reading may occur in a variety of ways. Students may read the text alone, with a partner, in a small group, aloud with the whole class, or even at home. Since this strategy focuses on comprehension, the student may also read the text without the teacher's assistance. After reading, the students need to check their guessed answers. Students change incorrect answers and expand on answers that need more information. When the learners ask suitable questions, they can then find relevant information to answer questions, monitor their comprehension, and help other learners answer questions they raised. To conclude, students complete a writing assignment to show what they have learned about the subject from reading (Brisk & Harrington, 2000).

When questioning, the learner is exploring the meaning of the text in depth. Self-generated questioning allows the learner to identify the kind of information that provides the substance for an appropriate question and to frame questions - before, during, and after the reading.

Several researchers talked about prompts used to help students generate questions. Muskingum (2003) considered the title, the paragraph headings, pictures, and italics as prompts to help students create predicting questions. These are mostly visual. Another procedural prompt is based on the work of Pearson (1985), who divided all questions into three types; each type is based on a particular kind of relationship between a question and its answer and the cognitive processes required to move from the former to the latter. The three types of questions are a question whose answer can be found in a single sentence, a question that requires integrating two or more sentences of the text, and a question whose answer can't be found in the text but rather requires that readers use their schemata or background knowledge. Discussing the same area, AL-Debes (2004) differentiated among three types of questions. Referential questions are questions whose answers are directly and explicitly shown in the passage. Inferential questions are questions whose answers are not explicitly shown in the text. They need some manipulation of the text to find the answers. The researcher needs to depend on certain syntactic, semantic, and situational clues. Main idea questions **are** questions whose answers show the intensions and the main idea of the paragraph.

The self-questioning strategy for use during a reading task should be described by the teacher first in some detail, followed by descriptions of how the strategy is used before and after reading. There are three phases in the reading lesson where students can generate questions provided that they are trained on forming questions (Robinson, Smith, & Richman, 2005)

- The Before Reading Self-Questioning Strategy: Here, the teacher helps his students to preview the reading text by asking themselves questions using the title or available pictures as hints.
- The During Reading Self-Questioning Strategy: Here the teacher train students to create questions as they are reading the sections in the text.
- The After Reading Self-Questioning Strategy: Here, the teacher trains the students on answering the questions and applying self-testing and peer-testing information that should have been gained from the text.

Semantic Mapping
In addition to question-generation reading strategy, the cognitive theory has given way to a new strategy that can be used not only in teaching English but also in all educational subjects. That strategy is 'Semantic Mapping'. Semantic mapping relates to four theories and areas: graphic organizers of Ausubel, schema theory, the educational significance of visual learning and communication, and Piaget's Theory.

The idea of a graphic organizer stemmed from Ausbel's view of meaningful learning (Novak, 2004). Ausbel stated that meaningful learning results when a person consciously and explicitly ties new knowledge to relevant concepts and experience he/she already possesses. This is why meaningful learning is lasting and powerful, whereas rote learning is quickly forgotten and

not easily applied in new learning or problem-solving situations. Its use showed significant results in improving comprehension.

Schema theory, which refers to way knowledge of concept is organized and stored in memory in the form of categories or slots, is frequently used to explain and test the effectiveness of organizers. Stott (2001) talked about another type of schema theory. He stated that this theory describes the process through which readers combine their background knowledge with the information in the text. The information within the existing schemata is known as prior knowledge and is believed to perform a crucial function in the learning process (Harp & Brewer, 1996).

Avegerinou & Ericson(1997) related graphic organizer to sensory learning stating that "the way one learns bears a strong relationship to the way his/ her senses operate" and "a very high proportion of all sensory learning is visual" (p.287). According to Ellis (2000), graphic organizers make reading content easier, to understand and learn as they make information more precise and less fuzzy. Then, graphic organizers reduce information-processing demands, as learners do not need to process as semantic information to understand the text because its structure is readily apparent.

Zaid (1995) suggested five phases to implement the Semantic Mapping Strategy. These are introducing the topic, brainstorming, categorization, personalizing the map, post-assignment synthesis. As Olson and Gee (1991) note that the use of various colored chalk or markers at each step of semantic mapping tends to promote student conceptualization and structuring of the topic and helps them recognize the different sources of information. Zaid (1995) suggested certain steps for teaching reading using Semantic Mapping. These steps are introducing the topic, brainstorming, categorization, personalizing the map, and post-assignment synthesis.

Empirical studies

Saft (2003) conducted a case study on a Fourth-Grade Ethiopian ESL student called Kiara. She experienced difficulty in the areas of reading and writing. She has difficulty comprehending text. Throughout one semester, graphic organizers were used in reading and writing to help organize her thoughts and to improve her comprehension. Kiara had begun to make progress in both reading comprehension and writing because of these two approaches.

Chularut and DeBacker (2004) investigated the effectiveness of concept mapping used as a learning strategy with students in English as a second language classroom. The findings showed a statistically significant interaction of time, method of instruction, and level of English proficiency for self-monitoring, self-efficacy, and achievement for all four-outcome variables, the concept mapping group showed significantly greater gains than the individual study group.

El-Koumy (1999) conducted a study, the purpose of which was to compare the effects of the semantic mapping strategies on the reading comprehension of learners of English as a foreign language. The subjects of the study were 187 freshmen enrolled in the department of French at the faculty of Arts, Menoufia University, Egypt. (1) teacher-initiated semantic mapping, (2) student-mediated semantic mapping, and (3) teacher-student interactive semantic mapping. The results showed no significant differences in the mean scores on the pre-test among the three groups of the

study. The post-test results revealed that students in the teacher-interactive semantic mapping group scored significantly higher than the teacher-initiated.

Therrien, Wickstrom, and Kevin (2006) conducted a research to ascertain if a combined Repeated Reading and Question-Generation intervention was effective at improving the reading achievement of fourth through eighth-grade students with learning disabilities. Students receiving the intervention i.e., those who were taught by question Generation strategy and Repeated Reading significantly improved their reading speed and ability to answer inferential comprehension questions on passages that were reread.

Kawabata (2007) proposed a program that could be used for EFL classes to teach reading strategies. The objectives of the program are 1. to enable students to understand the text structure of a particular genre, find the main idea of the text, learn new vocabulary, and learn effective learning strategies to develop reading comprehension. Kawabata suggested using articles from the newspaper. Among suggested strategies was students' generating questions
The previously-mentioned literature review reveals the following points:

1. Learners exposed to reading strategy instruction will reap good gains in reading achievement tests.
2. There is scarcity, if not unavailability in experimental studies, which investigated the effects of Semantic Mapping and Question Generation Strategies.
3. Studies that were conducted on using reading strategies, especially Semantic Mapping, in teaching Expository reading texts, were rare.

The current study tried to find that kind of relation between semantic mapping strategy and question generation strategy with expository texts.

Statement of the Problem
Foundation Program students in the Community College of Qatar find it challenging to comprehend reading passages as measured in their low grades in the reading comprehension tests. Analyzing students' results, one can quickly realize that a high number of them will try to look for a keyword in the question, which appears in the text and will write down all the words before and after that keyword as an expected answer to the target question regardless of the meaning. When coming to questions with higher thinking levels as inference, analysis, synthesis, or evaluation, they will get lost. Thus, the students seem to lack the appropriate strategies to foster their abilities in reading comprehension. This situation might be attributed to many reasons, one of which is the lack of specific training on the best strategies of dealing with texts. It is hoped that this study might help to find solutions to this dilemma by applying two reading strategies, namely the 'Question-Generation Strategy' and the 'Semantic Mapping' aiming at investigating whether these two strategies have a positive impact on students' achievement in reading comprehension or not.

Significance of the Study
The study is significant for teachers and students, as well. It came to show whether or not students will benefit from a training course on different strategies especially those that relate to cognitive and metacognitive ones such as how to plan, to analyze and then classify ideas into categories or

semantic slots, to generate one's own questions, to utilize one's schematic experience when necessary, to synthesize the ideas in a meaningful summary and monitor their understanding. In this way, teachers can fulfill the two main principles of modern trends in teaching English, namely training students in learning how to learn and enhancing their long- life learning.

Purpose of the Study
This study aims to explore the possible effects of two strategies, namely students' self-generated comprehension questions and semantic mapping on the reading achievement of ESL female students enrolling in Level 2 in the Foundation Program at the Community College of Qatar.

Study Hypothesis.
 The study aims to verify the following null hypothesis
> There are statistically significant differences at ($\alpha \leq 0.05$) between the achievement mean scores attained by the experimental group who was taught reading via Semantic Mapping and the mean scores achieved by the experimental group who was taught reading via the Question Generation strategy.

Definitions of Terms
 Semantic mapping: Al-Debes (1995) defines a semantic map as "A reading strategy that uses a diagram to depict the interrelationships and hierarchies of the content of reading texts" (p.9). It has the central idea in an oval or any geometric shape in the middle of the diagram, while the supporting details having another geometric shape in a second layer.

 Question-Generation Reading Strategy: Robinson, Smith & Richman (2005) define the question-generation reading strategy as "A self-questioning strategy is a set of steps that a student follows to generate, think about, predict, investigate, and answer questions that satisfy curiosity about what is being read (p.101). As one of the meta-cognitive strategies, 'question-generation' refers to writing post-reading questions using students' generated questions to develop an understanding of the important information in the text. By deciding what to ask, students think about what is important in the text.

 Expository text : It is one type of discourse genre. It refers to the texts that expose ideas and information in style similar to the scientific way where cause-effect relationships, contrastive ideas, discourse markers as those expressing addition, condition, purpose, concession, and sequence are used to join sentences together.

Limitations of the Study
1. The findings of this study will depend on the validity and reliability of the tests conducted by the researcher.
2. The study will be restricted to the population of the female students in the Foundation Program, studying English as a second language.
3. The study will be restricted to the expository genre of texts.
5. The study will be restricted to the following cognitive reading strategies: Semantic Mapping and Question Generation.

Design of the Study
The researcher used the quasi-experimental pre-posttests design comparing the results of two experimental groups on a post-test: one was taught by question-generation strategy, and the other was taught by semantic mapping strategy.

Population of the Study
The population of the study consisted of all Level 2 female students enrolling in the Foundation program at the Community College of Qatar in the second semester of the academic year 2018-2019.

Sample of the Study
This study followed the quasi-experimental design. The researcher used convenient sampling to select the two Level 2 classes available to the researcher as she was assigned to teach two Level 2 female classes. The total sample consisted of 40 students, 20 in each class. One class was selected randomly to constitute the first experimental group that was taught reading texts using the semantic mapping, and the other experimental group was taught by question-generation.

Period of the Intervention
The intervention lasted for four weeks of 12-class periods, one hour each.

Instrument of the Study
One instrument was used for the study: Reading Achievement Test. This was used as Pre- and Post-test. It consisted of an unseen expository reading text. The title of the text is "How to preserve food." The text consisted of five paragraphs; each one explains one method of food preservation. It is generally compatible with the average level of the students according to the readability equation of the CEFR-the Common European Framework of Reference. The whole test was out of 100.

The Instructional Material
To implement the study, the researcher chose four expository texts from the AMRA-EFL textbook. The titles of the reading comprehension texts are:
1. Stress and Pressure
2. Make it meaningful; make it active.
3. Data on the Fast Lane
4. Wedding in Britain versus wedding in Japan

The Reliability of the Test
In order to establish the reliability of the reading comprehension test, it was administered to a pilot group of 30 students chosen randomly from the population of the study and not included in the sample of the study. The students were tested and retested after 15 days. By using Pearson Formula, the reliability coefficient of stability was 85%.

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The validity of the test and the instructional material
In order to establish the validity of the research instrument and the instructional program, a jury of TEFL specialists were consulted for the appropriateness of the reading achievement test in terms of the number of the questions, the appropriateness of the reading texts, the general production of the test, the marks allotted for each question, pertinence of question category and the clarity of the questions and the suitability of the font by which the exam was typed. The jury consisted of four university professors. The instrument and the instructional material were modified in response to their comments.

Study Procedures
This study was conducted in the 2nd semester of the academic year 2018-2019. The researcher herself taught the two experimental classes. The researcher followed the stages mentioned in Walker (1996) to teach reading comprehension by Question Generation Strategy, but with some adaptation. The researcher told the students in both experimental groups about the problem she had noticed in their reading practices and explained that the following activity might help them. Thus they knew the rationale for the implementation of the activity.

Steps of teaching by 'question-generation strategy.'
This procedure was implemented at three stages of the lesson: before, during, and after reading the allotted texts.

Pre-reading stage
1. The researcher applied brainstorming to utilize students' prior knowledge of the topics of the texts. She made use of the titles of the texts. She discussed the meanings of the main vocabulary items. Students were encouraged to ask each other questions to know each other's prior knowledge**.** At this stage, no attention was given to the structure of the questions as long as the class understood them. Then, the researcher led students to apply the different skills to understand the allotted texts. Students applied skimming, scanning, discussions.
2. Then, the researcher discussed how to write questions:
   - A question has an answer.
   - A good question begins with a question word like who, what, when, where, or why.
   - A good question can be answered using the information in the text.
   - A good question asked about critical information in the text.

During-assignment stage
1. The researcher selected a short paragraph from the instructional material and modeled writing questions about the important information in the text.
2. The students wrote questions after they read a short paragraph.
3. The students answered their questions.
4. The students were divided into heterogeneous groups. They were asked to form questions on the other paragraphs and to compare their questions and answers with the teacher's questions and answers.
5. The researcher asked individual students, one by one, to create her questions.
6. The researcher gives feedback about the importance of the questions.
7. The students write questions about the important information in their assigned text.

Post-reading stage

8. Photocopies of a grid that contains three columns were distributed to each student. Each student had to write some questions in the first column. Then, the answers were in the second column. In the third column, another student will answer the same questions. Finally, they can compare their answers.

9. Students were given homework: to write three wh-questions on the text they had read on that particular day.

Steps of teaching by semantic mapping strategy

For teaching reading using the Semantic Mapping Strategy, the researcher followed the stages mentioned by Zaid (1995).This strategy was used at three stages of the lesson: before, during, and after the text explanation.

Pre-reading stage

1. *Introducing the topic***:** After determining the texts to be taught by a semantic mapping strategy, the researcher announced the topic of the unit by drawing a large oval on the chalkboard writing the topic inside it.

2. *Brainstorming***:** The researcher asked the students to think of ideas that might be related to this topic. This brainstorming phase allowed students to make use of their previous knowledge or experiences. At this stage, the researcher drew some of their prior knowledge categorizations using links and arrows from the central oval she drew in the middle of the blackboard. These ideas were just experimental, and they needed correction or elaboration at the second stage. During this categorization, the researcher introduced vocabulary words that students might need during the next phase of the activity. Once the pre-assignment semantic map (representing what the students know before doing the assignment) had been drawn on the chalkboard, the researcher had the students make their copies on their notebooks.

During-reading stage

3. *Categorization***:** Students skimmed and scanned the text. The overall discussion was allowed. The researcher asked wh-questions (Who, What, When, Where, How) to prompt them to think of categories. Then, the researcher encouraged the students to see relationships among their suggestions as "category clusters" (Antonacci, 1991, p.174) were formed. The researcher urged students to draw the before-lesson semantic map. Then the researcher erased it from the blackboard. Then, using the same colored chalk employed in brainstorming, the researcher recorded the elicited ideas in nodes connected by spoke-like straight lines leading from the central node different shapes from that at the primary level.

The map was modified as the class began to organize and integrate the individual suggestions. This "pulling together" phase allowed students, as they began to relate ideas, to see the connections between the ideas. In this phase, the students gained experience in practicing some valuable cognitive skills, particularly categorization and exemplifying, but also (depending on the topic) comparing and contrasting, cause and effect, inference making, and forming judgments.

4. *Personalizing the map***:** Students were asked to draw the during-assignment semantic map in their notebooks and then to compare it with the pre-assignment map. Each student was allowed

to add one or two sub-ideas that they felt important but not written in the text. New information was thereby integrated with prior knowledge.

Post-reading stage

5. Post-assignment synthesis: The last part of the class period was used to implement discussion centered on the amount of information acquired from the reading and how it had modified the original map. The researcher stated that all personal versions had validity and that even when a suggestion for modifying the chalkboard version of the map is rejected by the class, this does not mean the suggestion is without merit. The class as a whole decided the final shape that the map would take. The new version, with its different colors and shapes, highlighted what they knew before they did the assignment from what they started to know. It served as a visual representation of the knowledge they had gained from the assignment.

Finally, the map-either in its final chalkboard form or the personalized version made by each student- served as a springboard for other language activities. The map was used as an outline for the writing of a short essay on the topic. Sometimes, one segment of the map was used in the writing of a paragraph.

Findings of the Study

To analyze the data obtained from the pre-post tests in both experimental groups, the researcher used the following statistical analysis.

1. In order to ensure the equivalence of the two groups on the pre-test, the paired sample T-Test was used. The result showed that the two groups were equivalent before starting the intervention. Table 1 shows that.

Equivalency between the two groups

Table 1: *Paired Sample T-test to show the Equivalency between the two experimental groups*

	Mean	Std. deviation	N	Paired Differences (Pre-Post)	T value	df	Sig.
Question-Generation	72.70	9.92	20	-1.30	-1.242	19	0.229
Semantic Maps	74.00	9.17	20				

:Significance at the level of (0.05)
Not Significant

2. The paired sample T-Test was used on the pre-post-tests in the first group, which was taught reading by 'Question-Generation strategy' to find out if students' mean scores on the pre-post tests were significant. The results showed that the mean scores were significant. This means that the Question-Generation strategy had a significant impact on students' achievement. Table (2) reveals the results.

Table 2*: paired Sample T-test students' pre-posttests mean scores in the experimental group taught by Question-Generation Strategy*

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	Mean	Std. deviation	N	Paired Differences (Pre-Post)	T value	df	Sig.
Pre- test	71.65	10.82	20	-10.80	-7.743	19	0.000*
Post Test	82.45	7.36	20				

Significant

3. The paired sample T-Test was used on the pre-posttests in the second experimental group that was taught reading by Semantic-Mapping strategy to find out if students' mean scores on the pre-posttests were significant. The results showed that the mean scores were significant. This means that the Semantic mapping strategy had a significant impact on students' achievement. Table (2) reveals the results.

Table (3): *paired Sample T-test on the students' pre-posttests mean scores in the experimental group taught by Semantic Mapping strategy.*

	Mean	Std. deviation	N	Paired Differences (Pre-Post)	T value	df	Sig.
Pre- test	74.50	11.43	20	-12.90	-7.743	19	0.000*
Post Test	87.40	5.01	20				

Significant

The previously-mentioned tables show that there was a significant difference between the mean scores attained by students in the pre-and posttest in favor of the two experimental groups who were taught via the Semantic Mapping Strategy and the Question-Generation strategy. In other words, the two strategies proved to be significantly effective, each in its experimental group.

4. To compare between the two experimental groups and to find out whether one strategy is more significant than the other, The Paired Sample T-Test was used on the mean scores of the posttests attained by students in both experimental groups: the Question-generation group and the Semantic mapping group to find out which mean scores of the post-tests were significant.

Table 4: *paired Sample T-test on the post-tests according to the teaching strategy*

	Mean	Std. deviation	N	Paired Differences (Pre-Post)	T value	df	Sig.
Generation	82.45	7.36	20	-4.950	-2.266	19	0.035*
Semantic Maps	87.40	5.01	20				

Significant

Table 4 shows that the mean scores of the post-test of students who were taught by Semantic Mapping strategy were significant. This means that there was a significant difference between the mean scores attained by students in the posttest in favor of the Semantic Mapping Strategy over the Question-Generation Strategy.

Discussion of the results
Both strategies: the Question-Generation and the Semantic mapping proved to be significantly effective in teaching. However, when comparing the mean scores of students' post-tests in both groups, the Semantic Mapping group proved to be more significantly effective than the Question-Generation Strategy. This might be attributed to the idea that using visuals to facilitate learning was pedagogically effective. This is consistent with Olson's and Gee's study (1991), which revealed that the use of different colored chalk or markers at each step of semantic mapping tends to promote student conceptualization and structuring of the topic and helps them recognize the different sources of information. The results of the current study are also compatible with those obtained by the studies conducted by Darayseh (2003), Al-Debes (2004), Hammash (2005), Zaghlool (2003), Harper et al., (2003), and Kawabata (2007). They all used the experimental approach in which they compared the effectiveness of teaching via semantic mapping and the control groups via the traditional way. They found out that those students in the experimental groups gained better marks than those in the traditional group on a post-reading comprehension test.

Recommendations
In light of the findings of this study, the researcher suggests the following recommendations to ESL instructors, curriculum designers, and researchers:
1. The tertiary-level curriculum designers should include such strategies as Semantic   Mapping and Question Generation and many others in the curriculum, in the teachers' curriculum manuals and in teacher professional development in-service training programs, as many instructors are not acquainted with such strategies.
2. Researchers are invited to conduct similar studies to the current one. Besides, they are called upon to investigate the effectiveness of using other strategies in reading and other language skills.
3. Instructors should be eclectic in selecting the pedagogical approach, strategies, and techniques they utilize in the classroom.

Conclusion
Reading comprehension is a skill that embodies constructing meaning. This cannot be achieved except through involving students in analyzing the text by relating the text topic to their prior knowledge, by knowing the relationships and links among its ideas, by asking their questions on the text, and by synthesizing its separate ideas again and transferring them into a meaningful discourse or a semantic map. As both reading strategies, namely the semantic maps and the question generation, have proved efficacy with more significance to the semantic mapping, it would be advisable that teachers need to be eclectic in their pedagogical strategies so that they can satisfy all students' needs in mixed ability classes.

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