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Abstract
The purpose of this research was to examine the impact of employing concept mapping at a pre-writing stage on English as a foreign language (EFL) students' ability to generate better argumentative essays. Thirty-eight participants were randomly assigned to two groups participating in Writing II course at Al-Quds Open University (QOU). Both groups had the same teacher. The control group received instruction as required in the textbook only, and the experimental group were additionally required to construct concept maps at the pre-writing stage and compose essays based on the constructed maps. All participants were required to sit for pre- and post-tests to track their writing performance before and after the experimental group took a tutorial on how to create concept maps. After the implementation of the intervention, comparison of the students' mean scores of the pre- and post-tests showed a statistically significant improvement in the experimental students' ability to generate better argumentative essays in terms of point of view, unity and coherence, development, organization, and thinking. The results highlight the effectiveness of employing concept mapping as a focused instructional strategy at the pre-writing stage in developing EFL students' writing skill. Pedagogical implications for using concept mapping in EFL writing classes are considered.

Keywords
concept mapping, argumentative essays, idea generation, learning strategy, English as a foreign language (ELT)

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INTRODUCTION

It is widely recognized that writing is one of the most challenging skills for students to master (Nik et. al., 2010:8; Negari, 2011:299). Some researchers believe that good writing is indicative of good thinking (Rao, 2007); others suggest that writing stimulates thinking (Mekheimer, 2005). Getting thoughts on paper allows students to evaluate, review, adjust, reorganize, or modify their ideas. Apparently, the writing processes of planning, thinking, and organizing are just as important as the final product. This stresses the need for dealing with writing as a process rather than as a product (Hairston, 1992; Peregoy and Boyle, 1997). Both Hyland (2003:27) and Ahangari (2008:2) adopted a broader perspective taking writing not only as an individual's outcome but as a rich set of cognitive, social and cultural activities.

Clearly, writing is a demanding process. There is more to this process than just putting language units together; it requires a lot of preparation, brainstorming, planning, drafting, editing, and modifying. Brodney, et. al. (1999); First and MacMillan (1995); Hart (1997) ; Flower and Hayes (1981) have all emphasized the effectiveness of prewriting for easing the writing difficulty because it assists writers in laying out goals, brainstorming, generating ideas, organizing information, and building up the texts. According to Bourdin and Fayol (2000), proper prior planning promotes positive writing performance, and conversely, insufficient planning may lead to poor writing performance. Attaching importance to planning, skilled writers dedicate more time to prewriting (Hillocks, 1986).

Writing is a formidable skill for native writers let alone for EFL learners. Before writing, as Pishghadam and Ghanizadeh (2006: 108-9) suggested, EFL students need more planning and thus more learning strategies and techniques to overcome difficulties and to organize their ideas in a coherent and unified piece of writing.

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STATEMENT OF THE PROBLEM

As an EFL teacher at the university level, I always encounter students who struggle with academic writing. As a productive skill, writing requires a multitude of skills like brainstorming, reflecting upon previous knowledge, organizing information, and communicating ideas. At the university level, students need to write more complex texts, and thus are required to use more cognitive resources. With this in mind, EFL teachers need to think more creatively to implement the best ways to teach writing. Hacker, Dunlosky, and Graesser (1998) recommend instructional strategies which train learners to exercise cognitive skills as an important lever for boosting their performance in academic matters. Given these challenges, the main objective of this study is to provide EFL teachers with a focused instructional strategy of concept mapping at a pre-writing stage to help EFL learners generate better ideas in terms of point of view, unity and coherence, development, organization, and thinking.

LEARNING STRATEGIES AND THEIR INSTRUCTION

Learning strategies

In recent years, the trend has been to swing away from the emphasis on what people learn to how they learn, and so learners are required to employ new strategies in their learning process. A number of researchers examined the essence of learning strategies and the rationale behind their effectiveness in the learning process.

According to Stern (1992:261), learning strategies hinge upon "assumptions that learners consciously engage in activities to achieve certain goals, that they exercise a choice of procedure, and that they undertake some form of long-term planning." In the same vein, Wenden (1991:163) defined "learner training" as a series of activities geared towards enhancing a learner's skills in using strategies with an aim of helping him/her become an independent learner. Weinstein and Mayer (1986:315) took learning strategies as "behaviors and thoughts that a learner engages in during learning and that are intended to influence the learner's encoding

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process." Oxford (1990) proposed that learning strategies are actions on the part of the learner that facilitate and expedite learning in a more self-directed and effective mode.

For Nisbet and Shucksmith (1986:6), learning strategies were the processes underlying performance on thinking activities. In their view, there was more to strategies than being simply discrete strings of skills. They adopted a metacognitive stance toward strategy use and learning. In their analysis, due to the variability of learning strategies in terms of usability and ease of acquisition, there existed a hierarchy of strategies associated with the knowledge of an individual's mental processes.

Masters et al (1993) used the term "cognitive strategies" instead of learning strategies, defining them as "techniques, principles or rules that will facilitate the acquisition, manipulation, integration, storage, and retrieval of information across situations and settings." In their view, these strategies were central to the process of acquiring knowledge and developing the various language skills including writing among others.

Strategy instruction

Learning strategy instruction incorporates all activities performed by the teacher to transform students into active learners by training them on how to learn and how to employ what they have learned in their daily life. With persistent guidance and good prospects for practice, students learn to integrate new information with previous background, in a way that makes sense, facilitating information or skill retrieval at any time or place. Bright teachers can skillfully lead their students to exercise strategies until their use becomes an integral component of their inventory.

Brown (2000:130) urged teachers to use learning strategies by highlighting their effectiveness for learners in different settings, saying that: "… we probe its implications for your teaching methodology in the classroom, specifically, how your language classroom techniques can encourage, build, and sustain effective language-learning strategies in your students."

Richards et. al. (1992:355) stressed the significance of learning strategies for enhancing a learner's effectiveness. Then they sketched three approaches to strategy training. These are:

- Explicit or direct training in which learners are provided with information about the importance and purpose of specific strategies, trained as to how to use them and how to observe their own use of the strategies.
- Embedded strategy training in which the strategies are set in the normal content of the academic subject matter.
- Combination strategy training in which both explicit and implicit strategy training are employed.

Clearly, learning strategy instruction can be effective learner-centered approach to teaching if it is goal-oriented and conducted by a skillful teacher, and it has the right span and rigor to provide a well-designed scope and sequence of strategy instruction. In this way, students are bound to develop effective learning strategies which help them to use information better and to perform tasks more efficiently.

Considering that many EFL students struggle with developing strategies for acquiring a challenging language skill like writing on their own, a teacher skilled in introducing a given strategy can make a world of difference. The writing skill was described by Flower and Hayes (1980: 40) as a "strategic action where writers employ strategies to juggle with the constraints of composing." In their view, writing strategies represent judgments made by the writers to overcome difficulties arising from a writing activity.

CONCEPT MAPPING

The idea of concept mapping was originally derived from cognitive theory which sprang out of Ausubel's assimilation theory (Novak and Cañas, 2006: 3). According to this theory, the key determinant of an individual's learning was his/her previous knowledge. This theory took learning as most productive and meaningful when connecting prior knowledge with new information. That is, the acquisition of new knowledge hinged upon what was already known.

Novak developed the notion of concept mapping in the 1960s, in an attempt to represent visually the structure of information (Novak, 1991:45). In his view, concept maps were techniques for visualizing the relationship among different concepts (Novak, 1981). According to Zimmaro and Cawley (1998), concept

maps visually represented an individual's knowledge of a subject and graphically illustrate the relationships between concepts and ideas.

Concept maps were employed in various educational settings, and commonly had encouraging impact on acquiring knowledge and boosting attitudes (Nesbit and Adesope, 2006). According to Coffey, et al. (2003), employing concept maps allowed learners to easily embody and pass on their tacit knowledge. By enabling learners to use their previous knowledge to recognize novel concepts, and by connecting unknown information with known information, concept maps granted them profound perception (Novak, 2010). By creating essential connections in a hierarchical way prior to performing any activity, concept maps could bring about better understanding of the material.

In three different investigations of the students' attitudes towards the use of concept mapping as a strategy to improve language learning skills, Chularut and DeBacker (2004), Nobahar, Tabrizi and Shaghaghi (2013), and Sabbaghan and Ansarian (2013) all found that most of the students generally showed satisfaction with using concept mapping in their language learning. They concluded that the use of concept mapping boosted the students' attitudes, motivation, and engagement in EFL teaching and learning.

While Novak and Cañas (2010) associated the use of concept maps mainly with teaching/learning purposes, Plotnick (1997) adopted a broader view of the educational functions of concept maps as tools useful for promoting the different writing skills, foremost of which is the students' ability to employ them as pre-writing strategies to generate and organize ideas, and thus to produce a rich piece of writing.

In the beginning stages, concept maps were manual drawings. As a result of the advances in computer applications, new software was developed for drawing concept maps. Cañas, et al. (2004:2) asserted that just like how a word processor held up the job of writing text, technology eased the production of concept maps. In their analysis, greater tools allowed for executing bigger representations for composite fields, and for involving more people in the creation of the maps.

The application of concept map tools flourished in quantity and quality via the Web, multimedia, and Internet. Novak and Cañas

(2010:2) described new concept map tools as engines for knowledge creation. Using computerized concept maps could generate new ideas that could be easily and rapidly manipulated and adapted. Anderson-Inman and Zeita (1993) commended the easiness of editing computer-assisted concept maps because they allowed for rapid manipulations. Ease of access is another advantage of computerized concept maps, which, according to Plotnick (1997), saved space and facilitated retrieval.

As far as this study is concerned, concept maps, as graphic representations, had numerous benefits. They helped learners brainstorm and generate new ideas, organize and represent their thoughts to further understand information and discover new relationships, scaffold for cognitive processing, summarize and organize previous learning, maintain collaboration, consolidate educational experiences, develop critical thinking, defy long-held ways of thinking, boost learning achievements and interests (Adamczyk, Willison, and Williams, 1994; O'Donnell, Dansereau, and Hall, 2002 – cited in Tseng, 2012:102).

PREVIOUS STUDIES

The impact of strategy training on language learning has received a growing attention in the EFL circles. For example, Chen (2007) concluded that strategy training promotes language proficiency and evokes active internal modifications in the learning process. Owing to the explicit teaching of concept mapping as a learning strategy in expository writing for EFL students, Talebinezhad and Negari (2007) concluded that the students acquired more self-regulation in a writing task.

In an investigation of the impact of computer-based concept mapping as a pre-writing strategy for middle school students, Lin et. al. (2004) compared the computer-based concept mapping as a pre-writing strategy with paper-and-pencil concept mapping. In the study, computer-based concept mapping proved to be useful for generating ideas and improving the overall quality of the students' pre-writing concept maps as a prelude to a persuasive writing task. The students who devised the paper-and-pencil

concept maps scored better in persuasive writing than the others who produced computer-based concept maps.

In another investigation of the impact of concept mapping as a prewriting activity on EFL students' writing ability, Pishgadam and Ghanizadeh (2006) found that learners who entertained concept mapping strategy training demonstrated better writing performance than others.

Vakilifard and Armand (2006) studied the effects of instructional strategy of the progressive devolution concept map on informative text comprehension in French as a second language, and found that the experimental group, as compared to the control group following the traditional approach, had a better performance.

Lee and Cho (2010) investigated the effect of using collaborative concept mapping strategy in Korean writing classes on engaging the students in communicative and acculturative interaction. The results indicated that collaborative concept mapping strategy developed not only the students' overall writing skill, but also their ability in organization, language use, and vocabulary choice.

Liu et. al. al (2010) examined the effects of a computer-assisted concept mapping learning strategy on EFL college students' English reading comprehension. The study showed that the computer-assisted concept mapping learning strategy had more reading benefit for the low-level group than for the high-level group, and enhanced students' use of other English reading strategies, such as listing, enforcing, and reviewing.

Ahangari and Behzady (2011) experimentally investigated the effect of explicit teaching of computer-mediated concept mapping on Iranian EFL learners' writing skill in general and the components of writing (i.e. content, organization, vocabulary, language use, and mechanics) in particular. They found that the explicit teaching of computer-mediated concept mapping significantly improved the students' writing performance in general, and the content, organization, vocabulary, and language use in particular.

In an investigation of the effect of concept mapping strategy on the writing performance of sixty Iranian EFL students at the intermediate level, Negari (2011) found that the instruction of

concept mapping strategy positively and significantly enhanced the students' writing achievement.

Mansoor and Rahimi (2011) gauged the effect of concept mapping strategy on the writing performance of Iranian EFL university students, and concluded that the experimental group significantly outperformed the control group on the post test measure, and stressed the value of using concept mapping technique for developing the writing skill.

Lee (2013) investigated the use of concept mapping technique in a course module for Korean language learning with American college students, who were encouraged to engage in collaborative writing planning. Lee collected data during three writing sessions: pretest of writing, individual planning, and collaborative planning. The study findings showed that concept mapping is a feasible strategy to help L2 learners' writing planning process, thus ultimately improving their composition. However, the study results showed no improvement in the students' composition scores as a result of implementing peer collaboration for constructing concept maps.

Past evidence reviewed above seems to suggest concept mapping works for EFL students. This study, which experimentally examines the effect of concept mapping as a pre-writing strategy on Palestinian EFL students' ability to generate better ideas and thus better argumentative essays, differs from previous studies in three ways. First, the use of concept mapping and idea generation is dealt with at a pre-writing stage which would provide EFL teachers and students with a focused instructional strategy. Second, the concept mapping strategy is being used by a group of students not yet studied; there is no guarantee that this strategy will be a real asset to their writing. Third, the five dependent outcomes (i.e. the five aspects of the writing that are judged) are unique.

It goes without saying that a good argumentative essay should have a clear point of view or claim, coherence and unity, logical, thorough development, appropriate organization, and persuasive ideas. Thus, a good argumentative essay offers a claim, supports it with appropriate details, establishes a relationship between the ideas in order to maintain a rationale in their organization, and completes such ideas with a conclusion. A creative essay goes beyond this description and includes more original ideas.

More specifically, the study is meant to answer the research question: To what extent does concept mapping as a pre-writing strategy help EFL learners generate better ideas and thus better essays in terms of point of view, coherence and unity, development, organization and thinking?

METHODOLOGY

Participants

The sample of the study included 38 students enrolled in Writing II (5356) at the Bethlehem branch of QOU. The participants were all Palestinians and were all native speakers of Arabic. Their median age was 22 years, and the range was 18-30. They all had eight years of EFL instruction in grades 4-12 prior to their admission to QOU. Most students were concurrently taking reading II (1 hour weekly), structure II (one hour and a half biweekly) courses as part of their English language program at QOU. The participants of the present study had already passed Writing I course successfully. The 38 students were randomly assigned to two equal experimental and control groups of 19. In the experimental group, sixteen students were female and three were male. In the control group, fifteen students were female and four students were male.

Marking Criteria

Five marking criteria were developed by the researcher to assess the standard to which each essay writing aspect has been achieved. Each writing aspect has four rating levels of excellent to very good (10 – 8), good to average (7 – 6), fair to poor (5 – 4), and very poor (3 – 1).

Based on these criteria, three raters - EFL teachers working in a similar position as the researcher - marked the essays, giving a score for each aspect out of 10, with a total of 50 points, depending on the degree of similarity between the students' compositions and the standard descriptions given in Table (1) below.

Table (1) Marking Criteria

Writing Criterion	Aspect	Score
Point of view	Student's point of view or claim is clearly stated, focused, and strongly maintained in the thesis statement.	
	Introduction is effective for audience and purpose	
Development, Content and Completeness	Student's claim is adequately supported and thoroughly developed giving a sense of completeness; all ideas are valid and appropriate.	
	The best arguments of the opposition are addressed.	
	The supporting details include facts, examples, description, statistics, … etc.	
Unity and coherence	A single idea is developed in each paragraph	
	All ideas "hang together" and the reader understands them easily.	
	All ideas flow smoothly from one sentence to the next and from one paragraph to the next showing logical development of ideas.	
	Different types of argument structure indicators (e.g. reason, objection, contention, …etc.) are used.	
Organization	Logical, compelling progression of ideas is used in essay.	
	Paragraphs are structured according to an appropriate pattern (e.g. contrast-comparison; cause-effect; whole-part…etc.).	
	The essay has five paragraphs that include introductory and concluding paragraphs.	
Thinking	The essay has insightful, thought-provoking thesis statement.	
	Arguments display a high degree of logic, objectivity.	
	The line of the reasoning is easily identified; no gaps in thought are encountered.	
	The essay offers new ideas and relationships; the student shows ability to think for himself/herself, building on evidence arguments from the course but pushing his/her insights further than what is covered in the textbook.	

Data Collection Procedure

The present study was conducted over 16 one-hour meetings (including the pretest and post-test sessions) between January and June 2013. The two classes were taught by the same teacher (i.e. the researcher). The course book *Writing II*, and the instructional materials were identical for both groups; they received instruction as required in the textbook under the same conditions. The only difference was that the students in the experimental group, as opposed to the control one, were asked to construct concept maps

of each topic as a pre-writing activity and compose the required essay based on those maps. Meanwhile the control group was kept busy in routine activities extracted from their textbook in order to control the variable of time and to achieve the main objective of the study.

Instruments

The study had a pretest-posttest design. The two achievement tests were developed from the question database of the textbook. Both instruments included argumentative essay writing questions whose topics were chosen from the course book '*Writing II'* by Al-Quds Open University (2010).

This type of argumentative essays was particularly chosen for two reasons:

- To give the students the chance to choose the method of development that presents their ideas and arguments in the strongest possible way for their reader (i.e. induction and deduction; comparison and contrast; cause-effect; generalization and qualification, … etc.
- To ensure comparability of the writing outcome and thus give a sufficient level of confidence in the reliability of the obtained scores through establishing well-defined guidelines for the required writing task and conducting the test under comparable conditions.

The writing achievement pre-test was applied to evaluate the students' initial writing knowledge, and the writing achievement post-test was administered to measure the experimental effect on achievement. The students' writings in both tests were scored according to the criteria presented above.

Writing skill pre-test

For the purpose of pre-testing the writing skill of both groups, all students were asked to write one argumentative essay based on a writing task adapted from their course book *Writing II*. The students were asked to complete the test in one hour, under test conditions.

The students' writings were scored by three EFL teachers according to the marking criteria specified above. In order to guard against the expectancy of both participants and raters, a double

blind design was implemented. In this case, not only were the participants blinded by being kept busy in other activities, but the raters were also unaware of which group (control or experimental) they were dealing with. That is, they did not know whether the essay was from the experimental or control group or from the pre-test or post-test. They were blind to condition and they did not know the hypothesis of the study. Further, the researcher was not one of the raters to eliminate the bias that might come from the expectancy effect due to his interaction with the students in both groups.

Inter-rater correlations were computed in order to compare the three raters' scores. The minimum correlation was (0.87), which meant that the three raters were fairly consistent with how they assessed the students' essays and so the inter-rater reliability was decent. The three raters' scores were then averaged and rounded to the nearest half-point interval on a 0–50 score scale to produce the student's final pre-test-score on the two compositions.

In order to test all the participants' initial homogeneity, an independent sample t-test was performed to compare the mean scores of the two groups in the writing pre-test. As shown in Table (2), the results indicated no statistically significant difference between the pre-test means of both groups (p 0.929).

Table (2) Independent Sample T-test for the Pre-test Scores of both Groups

Independent samples test for pre-test control and experimental group				
	t-test for equality of means			
	T	SD	Sig. (2-tailed)	Mean Difference
Point of view	.188	0.59	.852	.11111
Unity and Coherence	.102	0.54	.919	.05556
Development	.188	0.61	.852	.11111
Organization	.180	0.59	.858	.11111
Thinking	-1.100	0.51	.339	-.6111
Overall Mark	-.090	2.46	.929	-.22222

This indicates that the two groups were homogeneous between the groups regarding their writing pre-test scores.

Intervention in the instruction of the experimental group

The intervention for the experimental group was instruction and practice in concept mapping. In addition to the pre-test and post-test sessions, the participants had 14 one-hour class meetings. The class teacher, the researcher himself, ran the whole strategy tutorial. The teacher received training on how to teach concept mapping strategy (following Harris and Graham's strategy teaching, 1996- see Appendix I).

In the introductory meeting following the pre-testing, the teacher gave the students of the experimental group an idea about the essence of concept mapping strategy and its benefits for developing their knowledge and skills. The students were reminded of concept maps as manual drawings. They were provided with a specially-prepared leaflet that included definition of concept mapping, different uses and examples of concept maps. Then they were introduced to advances in computer applications regarding the new software which had been developed for drawing concept maps. The students were also shown how technology eases the production of concept maps, especially in executing bigger representations for composite fields, and in involving more people in the creation of the maps.

Then, the teacher asked whether the students prefer to implement this strategy using computer-based concept mapping or paper-and-pencil concept mapping. Although most students spoke of having the basic computer skills, some expressed concerns about using new technology as a tool for drawing concept maps. Others showed negative feelings about the computer-based concept mapping and underestimated its significance and necessity, describing it as an unnecessary complication in drawing squares and arrows that can be easily done by hand. It became clear that the class consisted of a mixed computer ability group, and the majority of the participants from the experimental group expressed a strong preference for using the paper-and-pencil concept mapping because they described it as more practical and easier to manipulate. The paper-and-pencil concept mapping as a pre-writing strategy throughout the course was adopted not only to fulfill the participants' desire but also to control for the effect of the students' mixed abilities in using computers.

In the experimental group, the students practiced the application of concept mapping prior to writing essays at the planning stage. To create concept maps as pre-writing activities, students were firstly required to draw an idea map for the purpose of enriching their imagination and idea generation (Buzan, 2006). The student was instructed to place the main idea as a nucleus around which their ideas extend in different directions. What matters at this stage is idea generation.

Then the students were required to transform the idea map into a hierarchical concept map for the purpose of refining and classifying their ideas and thoughts into superordinate and subordinate concepts (Iwao, 2001). At this stage, the participants were required to place their ideas or concepts of the topic in squares. The squares were then connected together by arrows based on the relationships they envisaged for the topic. To specify or express the kind of relationship, they were asked to label the arrows by linking phrases or words.

The students practiced writing all types of essays using a concept mapping strategy in their brainstorming and planning processes at the pre-writing stage. The topics for the essays were introduced to the students depending on their sequence in the textbook. Similarly, the techniques for the essays were sequenced depending on their presentation in the textbook (e.g. comparison and contrast, cause and effect, generalization and qualification, interpretation of data, argument, inferences and conclusion, and multi-purpose composition. The control group wrote essays on the same topics with the same techniques but without employing concept mapping strategy.

The 14-meeting interval between pretest and posttest was spent on practicing the strategy for the experimental group to master the fundamental skills. One essay was composed every week for a total of seven essays for each student. During these meetings, other formal teaching techniques were not employed by the teacher. It is worth noting that, as time proceeds, the students became less and less dependent on the teacher. They happily got along with concept mapping training and showed more independence and discipline as the course progressed. For more details about the way of the delivery and the sequence of the study, see Appendices I and II.

Writing skill post-test

After the instruction of the strategy of concept mapping (at the conclusion of the trial period) all the students in both groups sat for a post-writing test in which they were required to write an argumentative essay based on an activity taken from their textbook. Their writings were scored by the three teachers according to the same criteria used with the pre-test.

As with pre-testing, inter-rater correlations were computed in order to compare the three raters' post-test scores. The minimum correlation was (0.89), which meant that the inter-rater reliability was also decent. The three raters' scores were then averaged and rounded to the nearest half-point interval on a 0–50 score scale to produce the student's final post-test-score on the two essays.

RESULTS, ANALYSIS, AND DISCUSSION

Table (3) gives an overview of descriptive statistics of all data. It displays the mean scores of the pre-test and post-test scores in the five writing components for the experimental and control groups. The overall pre-test mean scores of the control and experimental groups were 31.06 and 31.28, respectively. After the implementation of the intervention, the post-test mean scores for the control and experimental groups were 32.44 and 36.67, respectively.

Table (3) Descriptive Statistics of Pre-test and Post-test scores

	Group statistics mean and standard deviation							
	Control				Experimental			
	Test				Test			
	pre-test		post-test		pre-test		post-test	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Point of view	6.17	1.89	6.39	1.54	6.06	1.66	7.50	1.20
Unity and Coherence	6.11	1.60	6.22	1.52	6.06	1.66	7.39	1.14
Development	6.33	1.68	6.50	1.38	6.22	1.86	7.32	.89
Organization	5.83	1.69	6.50	1.29	6.04	1.99	7.05	1.33
Thinking	6.61	1.61	6.83	1.29	6.90	1.44	7.51	1.24
Overall Mark	31.06	7.88	32.44	6.40	31.28	6.89	36.67	4.38

As shown in Figure (1), the post-test mean scores of the experimental group were much higher than the pre-test mean scores in all essay argumentative writing aspects. Meanwhile, the post-test mean scores of the control group didn't increase much as compared with those of the pre-test.

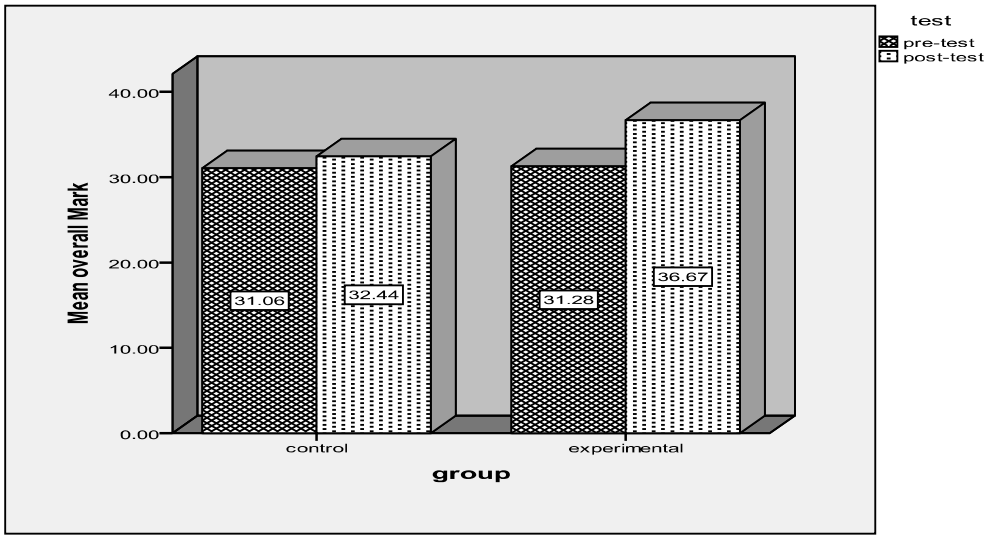

Figure (1)

As the descriptive data in Table (3) above show, the experimental improved most in the point of view aspect in which their mean score increased from 6.06 in the pre-test to 7.50 in the post-test, followed in descending order by unity and coherence, development, organization and thinking. In addition, the Partial Eta Squared was 0.024, which means that there are differences in the mean groups.

Clearly, by taking the main idea as a nucleus around which the most relevant supporting ideas are added, students can easily identify the irrelevant ones and eliminate them. This, of course, contributes to achieving unity and coherence which are closely tied to each other. When the ideas clearly support the topic sentence, their flow is readily understood by the readers. Moreover, the results also highlight the effectiveness of the concept-mapping strategy in improving the students' brainstorming ability to jot down more ideas, which enhances development, completeness, and content, which, according to Lee (2013: 257) has to do with

"generating valid ideas". This is consistent with Lin's (2003) conclusion that using concept mapping enhances idea generation in persuasive writing.

The results also highlight the effectiveness of the concept-mapping strategy in improving the students' organization. This is not surprising because the virtue of concept mapping lies in putting the ideas written in the squares together depending on the relationships represented by the arrows. As graphic representations, concept maps, which begin with a central idea and then branch out to illustrate how that idea can be supported by specific details, help students represent knowledge in an organized way. This makes it easier for EFL learners to distinguish between main and secondary ideas largely at a semantic level prior to the organized writing stage, and then easily build up clear rhetorical functions (e.g. compare-contrast, cause-effect, arguments, etc). This goes in line with Kellogg's finding (1990) that employing concept mapping strategy at a prewriting stage is beneficial for the memory by reducing the attentional overload during composing processes.

As shown in Table (4), a paired t-test performed on the mean scores of the pre-test versus the post-test for the control group indicates no significant differences regarding the five aspects of essay writing: point of view (0.701), unity and coherence (0.832), development (0.747), organization (0.193), and thinking (0.652). The overall p-value was 0.565.

Table (4)

Paired t- Test control pre-test and post- test				
	t-test for equality of means			
	T	Df	Sig. (2-tailed)	mean difference
Point of view	-.387	35	.701	-.22222
Unity and Coherence	-.213	35	.832	-.11111
Development	-.325	35	.747	-.16667
Organization	-1.329	35	.193	-.66667
Thinking	-.456	35	.652	-.22222
Overall Mark	-.581	35	.565	-1.38889

Table (5) displays the pre-test and post-test results for the experimental group regarding the five aspects of essay writing. The results obtained highlight the effectiveness of concept mapping strategy training in enhancing the students' performance in the writing aspects of point of view (0.005), unity and coherence (0.008), development (0.004), organization (0.004), and thinking (0.010).

Table (5)

Paired t- Test experimental pre-test and post- test				
	t-test for equality of means			
	T	Df	Sig. (2-tailed)	Mean difference
Point of view	-2.989	35	.005	-1.44444
Unity and Coherence	-2.803	35	.008	-1.33333
Development	-3.077	35	.004	-1.10000
Organization	-2.853	35	.004	-1.10000
Thinking	-2.83	35	.010	0.6100
Overall Mark	-2.800	35	.008	-5.38889

Overall, the results showed that paper-and-pencil concept mapping strategy positively and significantly influenced students' ability to present stronger claims, more unified and coherent paragraphs, more developed supporting details, more organized essays, and richer ideas and thinking. These findings are generally consistent with previous studies that showed a positive impact of concept mapping on promoting L2 learners' writing skills: Lee (2013) investigating the use of concept mapping technique in a course module for Korean language learning with American college students; Lee and Cho (2010) investigating the effect of collaborative concept mapping strategy in Korean writing classes; Ojima (2006) examining the effect of concept mapping as pre-task planning with three Japanese ESL writers; Lin et al. (2004) studying the impact of computer-based concept mapping as a pre-writing strategy for middle school students; and Pishgadam and Ghanizadeh (2006) investigating the effect of concept mapping as a prewriting activity on EFL learners' writing performance.

In short, in certain contexts, concept maps proved to be effective learning/teaching writing tools. In the concept mapping training process, EFL students had the chance to acquire several skills, including how to draw a map, how to reflect upon previous knowledge, how to produce new ideas, how to connect and label concepts, how to more clearly communicate ideas, and how to organize information. These skills enable students to contemplate the associations among concepts (Novak and Gowin 1984), and reflect upon their own (mis)interpretation of such concepts (Boxtel et al. 2002). Once students understand accurately the interrelationships among concepts, they are able to write coherent and organized text. As a result, they improve their writing performance. In the light of these results, EFL teachers are encouraged to employ a focused instructional strategy of concept mapping as pre-writing strategy in enhancing their EFL students' writing skill.

CONCLUSION AND IMPLICATIONS

This study investigated the impact of concept mapping as a pre-writing strategy on Palestinian EFL students' ability to generate better argumentative essays. The results showed that the experimental group of Palestinian EFL university students had significantly higher post-test scores than the control group.

The most striking result to emerge from the data is that concept mapping strategy is beneficial for enhancing EFL students' argumentative compositions when employed as a focused instructional strategy at a specific pre-writing stage and when properly introduced and monitored. Rao (2007) found that the performance and attitudes of the students who received training on brainstorming strategy was better than that of those who did not experience any training.

Clearly, concentrating on the main concepts, establishing logical connections among ideas and organizing them based on constructed maps at the pre-writing stage, EFL students demonstrated improvement in composing better argumentative essays in terms of claims, unity and coherence, development, organization and thinking.

What is interesting in the data obtained from the present study is that the students of the experimental group were successful in generating new ideas and relationships, and their writing reflected better ability to think for themselves. Khodadady and Ghanizadeh (2011) found that concept mapping significantly and positively influenced learners' critical thinking ability. This also goes in line with Sturm and Rankin-Erickson's (2002) conclusion that concept mapping strategies can stimulate beginning writers thinking process to complete the writing activity, and help them maintain more developed writing processes.

In fact, several studies take concept maps as "metacognitive tools" (Mintzes, Wandersee and Novak, 1997: 411) which allow for reflective thinking about learning via the visual representation of concept associations.

This has significant implications for EFL learning/teaching. Concept mapping can produce more autonomous EFL learners. In this study, as noted in the methodology section, the teacher's role was essential in the first stage during which students needed guidance and training, but later students became less and less dependent on the teacher. This goes in line with Talebinezhad and Negari's (2007) conclusion that concept mapping strategy significantly promoted students' self-regulation.

Therefore, this study recommends EFL teachers incorporate the concept map strategy in their classes as a brainstorming exercise or pre-writing activity. EFL students need to be carefully and smartly introduced to the concept mapping strategy, and so a period of direct training is required before students can successfully construct their own concept maps. Moreover, prior to any use of concept maps, teachers should give particular emphasis to the students' computer ability lest this hinders effective utilization of these maps. Further, EFL students' first attempt to create a concept map should be done within the context of a simple, familiar topic (e.g., animals or plants). In short, if concept maps are to realize their potential as a teaching/learning tool in writing classes, EFL learners' needs, wants, expectations, and cognitive abilities should be taken into account.

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Appendix I: Strategy Training (Tutorial)

Following Harris and Graham (1996), the following five-step strategy was employed to train students on dealing with concept mapping:

Strategy description: The first meeting was devoted to informing the students about the plan of the strategy tutorial. Then the students were given a specially-prepared leaflet in which concept mapping was defined as a useful strategy for classifying information in a graphic structure via drawing. They were also informed about the importance of concept mapping for prewriting activities. For making sure that students understand how to draw concept maps, students were advised to download two short films about concept maps from *www.youtube.com*. One film was about '*The seven laws of making mind maps'* and the other was about '*how to start your term paper using concept maps*'.

Discussing the goals and purposes: To clarify the goals and benefits of using concept maps, the researcher stimulated a discussion with the experimental group about their experience and perception of concept mapping.

Modeling the strategy: Having provided the students with the required theoretical background, the researcher involved them into a practical task. First, the students' preferred topic was written on the white board as "main idea" of the concept map, and then they were asked to suggest subtopics and to generate details to be added to the subtopics. After being taught how to draw links to connect ideas and how to go for the most important ones, the students were instructed as to how to place them on the map. Upon completion of the map, the students were shown how to transfer the details into sentences to develop a essay. This involved presenting a series of procedures for transferring concept maps into written essays, moving from top-level information to lower-level ones.

Students' mastery of strategy steps: Students, individually and collectively, were exposed to more practice on drawing concept maps via well-designed tasks to ensure their mastery of the series of steps required for concept map production.

Guided practice and feedback: Students were asked to construct their own concept maps for their preferred topics. Then, they were required to develop essays based on their concept maps. Students received feedback on their concept maps and on their writing performance.

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Appendix II

A. Content of learning materials:

Unit	Content
One	Comparison and Contrast
Two	Cause and Effect
Three	Generalization and Qualification
Four	Interpretation of Data
Five	Argument
Six	Inferences and Conclusion
Seven	Multi-purpose Composition

B. Experimental procedure:

Weeks	Groups	Content
1	Exp. + Cont.	Pre-test
Additional three-hour meeting	Exp.	Tutorial on concept mapping
2 – 3	Exp. + Cont.	Unit One
4 – 5	Exp. + Cont.	Unit Two
6 – 7	Exp. + Cont.	Unit Three
8 – 9	Exp. + Cont.	Unit Four
10 – 11	Exp. + Cont.	Unit Five
12 – 13	Exp. + Cont.	Unit Six
14 – 15	Exp. + Cont.	Unit Seven
16	Exp. + Cont.	Post-test

Note: The tutorial on concept mapping was given to the experimental group in the three-hour additional period during the first week. The course book *Writing II*, and the instructional materials were identical for both groups. The only difference was that the students in the experimental group, as opposed to the control one, were asked to construct concept maps of each topic as a pre-writing activity and compose the required essay based on those maps.