

Using Mind Mapping Technique to Improve Reading Comprehension Ability of Fourth grade Arabic Language Students in Jordan

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Abstract: The study aimed to investigate the effects of electronic mind mapping on on the development of Arabic language reading comprehension among the fourth grade students in Jordan.. This study used a quasi-experimental research design with pre-test and post-test control groups. The study sample consisted of 65 students, 34 students in the control group and 31 in the experimental group. The experimental group was taught the chosen texts using the Electronic Mind Mapping strategy while the control group was taught the same texts using the traditional method The experimental group was taught using electronic mind mapping, while the control group was given traditional classroom instruction. An achievement test with reliability coefficient of (0.87) was administered for both groups as a pre and a posttest. The results reveal a statistically significant difference between the two groups, in favor of the experimental group attributed to using electronic mind mapping.

Keywords: electronic mind maps, reading comprehension in Arabic language, teaching Arabic

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I. INTRODUCTION

Reading comprehension is considered the basic of all language skills and the ultimate goal of the reading process (Ortlieb, 2013), where learners set connections between the learning activities, the learner's experience and the learner's prior knowledge to form the meaning of a text (Mohaidat, 2018), this constructive approach asks for designing of instruction that deals with learners as builders of knowledge, where learners could construct knowledge through interaction and connecting their experiences and prior knowledge with the current situations. This process will help in building learners knowledge and understanding (Terhart, 2003).

Reading comprehension is associated with the brain, the place where the process of seeing and understanding happen at the same time (Moore & Lo, 2008; Lipson & Wixton's, 2009), and affects the academic achievement and success in the different academic subject, and if there are, to detect learners misconceptions or insufficient comprehension. Such approach is used with the stated objectives to emphasize on the teaching of strategies that enable learners to learn with understanding.

Since reading comprehension requires the formulation of mental images and visual perception of symbols and written words (Zeki, 1993), moreover mind mapping is a visual technique that has being used to elicit learners' pre-knowledge and the new information they learn during the learning process. Mind mapping is a "useful tool for helping younger students with the process of building conceptual understanding of content and promoting achievement" (Mona & Khalick, 2008, p. 298). Mind maps facilitates meaningful learning (Akinoglu & Yasar, 2007; Buzan, 1993; Erdogan, 2008), and promote active-learning of language learning among students (Ellozy& Mostafa, 2010; Al-Jarf, 2009). For such an approach to work, students have to be taught how to use and construct the maps. Buzan (1993, p.59), defined the mind map as "an expression of Radiant Thinking and is therefore a function of the human mind. It is a powerful graphic technique which provides a universal key to unlocking the potential of the brain"

Literature review indicate that, there have been several studies aiming to identify the efficiency and limits of mind maps in the literature (Williams, 1999; Brinkmann, 2003; Ling, 2004; Amma, 2005; Treviño, 2005). Based on principles of the constructivist approach, mind maps facilitates meaningful learning (Akinoglu & Yasar, 2007, Buzan, 1993, Erdogan, 2008). Students can think and develop their conceptual schema by assimilate new information, to do so, teachers must construct an appropriate structure for the new information by examining their mind maps(Zhao, 2003). Basing on this, mind maps are considered a technique that could be used in constructivist language lessons because, they develop creativity and promote individuals' learning

(Mento, Martinell & Jones, 1999). Previous research confirmed that visual presentation is an essential for learners to understand new knowledge, they assume learners to recall knowledge and to show the relations between different thoughts and concepts (Buzan & Buzan, 1995; Buzan, 2002; Buzan, 2005). Mind mapping could provide teacher with a feedback about learners' mental structure and development of their mental structure, also, it could facilitate learners' recalling the knowledge by the assistance of using visual elements and could be used as an activity that makes the learners participate in their lesson.

Furthermore, mind maps can be used by hand and paper or by computer. Using paper mind maps seem to be time consuming because students need to erase many times and rewrite again and again (Erdogan, 2008). By using electronic mind maps can benefit from computer to create mind maps; students can move objects branches, concepts, add colored simply by drag and drop them. When student finish drawing the map. It can be saved as files and re-opened and re-used again. Files can be shared with other students, and it can be connected to other files. Students using electronic mind maps can attach and view video, sound, clips, animated pictures, and images (Riley & Ahlberg, 2004).

In mind maps however, The main idea is presented as a cartelized picture drawn in a central image, then the main themes of the main idea radiate from the central image as branches. To form a connected nodal structure, a key image or key word is printed on an associated line of the branches. Images, words, numbers, reason, imagination are function as a secondary center of association and then proceeds in an endless chain of relationships that branch off from the center and extend out to a mutual center (Buzan & Buzan, 2015). colors and images are added to enrich learning (Buzan & Buzan, 2015; Buzan Dottino & Israel, 2013). McGriff (2000) confirmed that relating images to concepts is a creative task which requires thinking instead of memorizing. Chen (2008, p.1034) stated that "the adoption of colors, images, codes, and multidimensional approaches to help human memory, so that one could concentrate the mind on the central part, which is, the crucial subject". Buzan and Buzan (2015) asserted that utilizing mind mapping is an appropriate technique for stimulating all the different functions of the brain, including memory, creativity, and learning. According to Wen-Cheng, Chung-Chieh & Ying-Chin (2010) using mind mapping technique is a unique method for exercising many component, such as thinking, feeling, attention, coordination, reasoning, hearing, motion sense, implementing skills, visualizing numbers and letters, reading, and analyzing are all related to each other in mind map.

Purpose of the study:

Several studies were conducted to investigate the effect of mind maps on reading comprehension in English language (Stankovic, Besic, Papic & Aleksic, 2011; Peng, 2011), they all agreed that mind maps have a positive effect on reading comprehension. In Jordan, however, research has provided relatively little insight into the role of mind maps on young learners' Arabic language achievement. In this sense, the aim of this study is to examine the effect of mind mapping activates on reading comprehension achievement among Jordanian fourth grade students using electronic mind maps. The questions formulated for this study are as follows:

- Is there any statistical significant difference in reading and comprehension in the Arabic language achievement between Students taught via the utilization of electronic mind maps and students taught via the traditional method?

Significance of the Study:

This study is in line with the recent trends in the field of education which aimed at computerization of education, where the electronic mind maps is invested in the educational field, and therefore, the potential of the beneficiaries of the educational process from the results of this study, teachers in Jordan will have additional instructional media that can be used to support students' learning with understanding. This study can be useful For Arabic language Teachers by providing a practical model of how electronic mind maps will be used to teach their students. Moreover, It is hoped that the findings of this study will help educators in Jordan in their search for an effective and efficient pedagogical strategy or model for improving learning with understanding by using electronic mind maps.

Subjects of the Study:

Two fourth grade sections, one consisted of (30) male students and one consisted of (34) male students were selected from two nearby schools. The selection was based on the agreement of both schools to conduct this study. One of the selected sections was randomly assigned to an experimental group, while the other section was control group

Study Design:

This study used a quasi-experimental design with control and experimental groups. A pre-test, post test design was used. the experimental group studied using the electronic mind mapping technique, while the

control group was not subject to any treatment. They were taught the same content used by the experimental group but using the traditional method.

Instruments

Achievement test

Based on the table specification for the unit, an achievement test was developed by the researcher. The test consisted of 30 multiple-choice items with discrimination coefficient values ranged from 0.27 to 0.74 and their difficulty coefficients ranged from 0.49 to 0.82. The test was validated with a reliability coefficient of 0.87. Each item of the test was giving one point, this will make the total test score = 30 points.

Electronic mind mapping class plan

All curriculums in Jordan are uploaded on the Jordanian ministry of Education site. The site shoes units and their objectives. In order to investigate the fourth grade students' learning comprehensions of the Arabic language achievement in a naturalistic setting of the classroom, the instructional materials that used in this study were based on the second unit from the Arabic language textbook designed by the Ministry of Education for all fourth grade students in Jordan. For each lesson plan, content were analyzed and main idea, main themes of the main idea, images, key words were drawn and electronic mind maps were developed for each lesson .by the researcher with the help of an Arabic teacher.

Data collocation and analysis

Pre test was administered to participants of both groups (experimental and control) before treatment, then post-test was administered to participants of both groups after treatment. Based on the answer sheet, questions were graded and final grades was posted. Means, standard deviations were calculated and independent sample t-test, and ANCOVA were performed.

Study Procedures:

To achieve the purpose of the study, the following steps were taken:

- 1) To ensure the control and experimental groups were equivalent in reading comprehension, the pre-test was administered for both the control and experimental groups. A comparison of the results of the two groups showed that there was no statistically significant difference ($\alpha = 0.05$) in the reading comprehension levels of the two groups.
- 2) A lesson plan for the four chosen texts was prepared. The lesson plans were in accordance with the Teacher Guide of Arabic language for the fourth grade students.
- 3) prior to treatment, I Mind Map software was installed on each computer in computer lab in the school where the study will take place.
- 4) The researcher trained the teacher of Arabic language and students in the experimental group on how to design mind maps using the I mind map software and how to use them in classroom situations.
- 5) The trained teacher taught the experimental group in the computer lab but the control group was taught by another Arabic teacher taught using the traditional method. Both groups taught the same content and both groups administered the post test after finishing teaching all texts.

II. RESULTS

Equivalency between groups

Table 1. shows means, standard deviations and (t) for pre- test scores for the control and experimental groups. T-test results showed that there were no significant differences between the control and experimental groups ($t=0.504$, $P=>0.05$) in the achievement pre-test scores. These results indicate that both groups (Mind Map and Control) were equivalent .

Table 1: Means, standard deviations and (t) of the pre-test by the groups(Mind map and control)

Achievement	Means	N	Means	S.D	df	t	p
Test	control	34	11.96	6.07	63	0.504	0.61
	Experimental	31	12.64	4.74			

Table 2. shows means, standard deviations for post- test scores for the control and experimental groups, results show that there are differences between the control group and the experimental group in the student achievement scores.

Table 2: Means and standard deviations of the post-test by the groups, Mind map and control.

Achievement Test	Groups	N	Means	S,D
	Control	34	15.93	5.35
	Experiment	31	20.76	4.85

Table 3. shows the results of ANCOVA which indicate that there is statistically significant difference between the groups (the experimental and control). The F ratio was 21.381 ($p = .000$). This means that the Mind map method had a main effect on fourth grade students' achievement reading comprehensions in Arabic language.

Table 3. ANCOVA results

Source	S.S	df	M.S	F	Sig	Eta ²
Achievement	730.181	1	730.181	49.869	0.00	0.44
Group	313.059	1	313.059	21.381	0.00	0.25
Error	907.808	62	14.642			
Corrected total	2016.154	64				

III. RESULT AND DISCUSSION

The study was carried out to investigate the effects of electronic mind mapping on student achievement on the reading comprehension of fourth grade students Arabic language course. The results showed that there is a statistically significant difference between the groups in achievement test scores in favor of the experimental group. A review of literature showed that mind mapping technique has positive impact on reading comprehensions in English language (Siriphanich & Laohawiriyanon, 2010; Liu, Chen & Chang, 2010; Kim & Kim, 2012; Hofland, 2007; & Malekzadeh & Bayat, 2015; Gomez & King, 2014; Bidarra, Kommers & Guimarães, 2000; Al-Awidi & Jaradat, 2014). Farther, literature review did not find any studies that examine the utilization of mind mapping in the development of reading comprehensions in Arabic language. In spite of known that utilizing mind mapping in teaching and learning requires learners to prepare their own mind maps, this process gives learners the opportunity to implement many skills (Buzan & Buzan, 2015; Buzan, Dottino & Israel, 2012). Further more, utilizing mind mapping technique in teaching and learning aids students in thinking skills, establishing relationships, analyzing, focusing and creativity (Buzan & Buzan, 2015; We-Cheng, W., Chung- Chieh, L., & Ying-Chien, C., 2010).

Using mind maps in learning the process of reading comprehensions is a unique method that captures the mental constructions used by the learner and their understanding. Understanding is formatting cognitive connections (Haylock & Cockburn, 2014); Accordingly, students using mind maps create a network relationship linked with their cognitive connection, as the network relationships increase the cognitive connection increases and supports learning.

When the features of the electronic mind maps created by fourth grade students in this study, text analysis was performed, and an understanding Main ideas and sub-ideas, and assimilation through the adoption of Electronic mind maps on the principle of linking sub ideas and examples with Its main assets in a sequential and accessible way. Although, utilizing the electronic mind maps assisted four grade students to insert pictures and shapes, use colors in a flexible way in building mental maps in an innovative computing environment. Also, it helped students to re-represent the ideas written in the abstract words in an illustration shape Based on the realization of the naughty brain words and numbers to the left side of the brain, and Images and colors of the right section of the brain (Siriphanich & Lohawiriyanon, 2010; Berg; 2011). Since there is agreement that the electronic mind map works the same way the brain works, its use has led to the activation and use of both sections of the brain, and arrange information in a way that helps the mind to read and remember Information rather than traditional linear thinking, and provide strategies help students analyze text, arrange their ideas and install them in Brain; which helped to develop their reading comprehensions.

Although the themes of the mind maps used in this study was new method and teaching technique for Jordanian fourth grade students and this may distanced them from the boredom and monotony associated with the normal method of teaching reading comprehensions Arabic language. Several studies which dealt with the use of mind maps as a Teaching technique in teaching different materials have shown (Hariri, 2011; Trevino, 2005; Al-Jaraf, 2009) positive attitudes toward learning these particular materials. Especially, the electronic mind map is simple, working on it in a computer lab has Create an atmosphere of student competition with each other in use Computer skills in their preparation, which helped them produce maps. The mind map contains the ideas contained in the texts, and this indicates the Students absorb these texts. results from the academic achievement test results, show that the experimental group students obtained higher grades than those of the control group. These results sport the notion that Students taught Arabic language contents with the use of traditional methods often experience difficulty in comprehending some of the concepts and their correlation

with related information studied in previous courses. Moreover, since this study used in a constructivist learning environment, particularly the students' organization of knowledge, the valuable result of the mind map teaching technique is not yet clearly understood. Previous research has confirmed the conclusion of the present study (Abi-El-Mona & Adb-Ei-Khalick, 2008); Amma, 2005; Harkirat, Makarimi & Anderson, 2011), in which students taught with the use of constructive learning techniques based on preparing mind maps got higher academic achievement than that of the traditionally taught students.

Suggestions and Recommendations:

Based on the finding of this presented study, the following relevant suggestions and recommendations are made:

- utilizing electronic mind maps improves the reading comprehension skills in Arabic language for fourth grade students in Jordan; student teachers should be given pre-service training courses in the use of the electronic mind mapping technique, this would be beneficial to both teachers and students.
- Conduct further studies and procedural research aimed at extrapolation of the impact of electronic mind maps in other skills in Arabic language as well as other subjects.

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