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The Effectiveness of the E-mind Mapping Strategy for Sixth-Grade Students' Achievement Level in Learning Arabic Vocabulary in Kuwait

Abstract

The purpose of the presented study was to identify the effect of using the e-mind maps strategy at the academic achievement level in learning Arabic vocabulary skills among six-grade primary male students in Iben Al-Atheer School for Intermediate Education in Kuwait in the 2017/2018 school year. The sample of the study consisted of 60 male students, equally divided into two groups, experimental and control ones. The result of the study indicated that there were statistically significant differences between the mean scores of the experimental group and the control one in the post achievement level test scale in favor of the experimental group. The effect size of using mind maps was high. There were statistically significant differences between the mean scores of the experimental and control group scores in the post achievement test of the Arabic vocabulary learning in favor of the experimental group. The study concludes with recommendations for future mind-mapping in other contexts.

Keywords: *mind mapping, strategy, vocabulary, sixth grade, Kuwait, achievement*

Introduction

Learning vocabulary is considered the most essential and significant part of learning any language, whether it is a second language or the first one because without sufficient vocabulary students cannot understand others or express their own ideas (Al-Qahtani, 2015). According to Nation (2001), learning any language starts with learning its words and vocabulary. Brown (2002) further states that vocabulary is as a building block and a core component of any language, which indicates how significant it is to learn vocabulary. Horst (2005) identifies a strong relationship between one's reading comprehension level and vocabulary knowledge. In other words, acquiring more vocabulary is considered a step towards improving one's reading comprehension level, which enables one to have a better understanding of the text.

A considerable amount of research on the use of mind mapping strategies in developing learner's vocabulary has shown that using mind mapping in the classroom motivates and engages students throughout a lesson, improves their academic achievement level and s the learning process more meaningful. Mind mapping enables teachers to design and organize activities and engage students' cognitive and innovative potentials into the learning process (Aljaser, 2017; Hamdan & Alharbi, 2017; Bahadori & Gorjian, 2016; Al-Otaibi, 2016; Gorjian, &Bahadori, 2016; Al-Badwoi, 2015; Leyden, 2014; Rabeka, 2014).

Al-Jarf (2011) stated that mind mapping software is considered a graphic organizer through which the main ideas of categories diverge from a central idea or image and lesser categories or ideas are presented through branches that diverge from larger branches. According to Buzan (2000), such software can be used to improve one's memory, develop concepts, ideas, and take notes.

Multiple studies confirmed that mind maps allow students to have a better conceptual understanding of basic principles when there is a great deal of information, and promote active learning to improve their memory, especially when retrieving written information (Al- Aljaser, 2017; Nodoushan & Maibodi, 2017; Kaveh, & Rassaei,2016; Tarkashv, 2015; Carol, 2015; Toi, 2009).

At the same time, Baek (2011) reached a conclusion that mind mapping does not have any positive impact on students' achievement level before the ninth grade level, because younger students do not have enough knowledge to benefit from mind maps. Henceforth, in the presented study the researchers expect that the result of this study will allow for yielding further information about the effects of using mind map on learning the vocabulary of one's native language, especially Arabic vocabulary skills.

Research Problem

Despite the increasing availability of technology and efforts to connect each classroom to the information superhighway, some Arabic teachers in Kuwait have been reluctant to adopt technology and revise their pedagogy. In fact, the problem lies in the Arabic language teaching and pedagogy, still influenced by traditional approaches to Arabic literacy pedagogy and language teaching, which impacts on the student's low performance in the Arabic language and has a lasting effect on Arabic backwardness. Hence, the aim is to have an education system that resembles its counterparts in developed countries by utilizing technology and the latest language teaching pedagogy. Therefore, the researchers of the presented study aimed to identify the effectiveness of using mind mapping strategies in improving the Arabic vocabulary skills of six-grade students at that state of Kuwait. With this regard, the study was designed to address the following hypothesis.

H0: There are no statistically significant differences (at the significance level of $\alpha=05.0$) between the achievement levels of sixth-grade control and experimental groups in learning Arabic vocabulary at Kuwaiti schools that can be attributed to the method of learning (i.e., the traditional method or the EMM strategy).

Research Focus

In Kuwait, there has been no systematic research into the use of mind mapping as a tool with sixth-grade Arabic students' vocabulary learning skills, or analysis of the lack of use of mind mapping in teaching and learning the Arabic language, which has hindered the memorization of Arabic vocabulary taught in the classroom. Therefore, our research efforts focus on identifying the effects of using the e-mind maps strategy on the academic achievement level in learning Arabic vocabulary skills among six-grade primary male students in Kuwait. Although this research has many components and involves many studies, there are three primary thrusts.

One thrust is to illustrate the utilization of mind-mapping-based instruction by Arabic teachers in the state of Kuwait, to improve the classroom-learning environment, and to increases students' technological fluency and digital literacy. The second thrust involves field studies investigating the effects of using the e-mind maps strategy on the academic achievement level in learning Arabic vocabulary skills, and the third thrust is to develop new tools to improve the Arabic language proficiency of the Arab students.

There is hope that the finding of this study will contribute to a further understanding of the role of digital mind maps in improving Arabic vocabulary achievement, and fill the gap in the relevant literature due to the scarcity of studies addressing the effectiveness of EMM for learning vocabulary.

Methodology

Design and Procedures

This study adopts a quasi-experimental approach with a two-group design. The sample was drawn from among male sixth-grade students at the Iben Al-Atheer School for Intermediate Education for Boys in Kuwait in the 2017/2018 school year. The students were divided into two groups: an experimental group, which was exposed to digital mind mapping software, and a control group, which had traditional English vocabulary lessons.

Both groups were given pre-test and post-test that focused on the students' achievement in three major vocabulary skills (spelling, word recognition, and vocabulary use). The Arabic vocabulary was selected from 8 units in the sixth-grade Arabic language curriculum, and e-mind maps were designed to teach them. To assess the effectiveness of the technique, a multiple-choice achievement test was designed by the researchers. The test consisted of twenty-five items with one score per item. The validity and reliability of the test were checked. The achievement test forms were distributed to both groups before applying any teaching method (i.e., the pre-test) to ensure that the groups have equivalent achievement and knowledge levels. Next, the experimental group was given two lessons about selected Arabic vocabulary using e-mind maps. Meanwhile, the control group was given two lessons using the traditional method. Then, the achievement test forms were distributed to both groups (i.e., the post-test).

Finally, the selected vocabulary words were illustrated to the experimental group using the designed computerized e-mind maps in two lessons. The same vocabulary words were illustrated to the control group using the traditional teaching method in two lessons. Then, both groups completed the same achievement test (i.e., the post-test).

Participants

The research population included all sixth-grade students enrolled in public schools at the Iben Al-Atheer School for Intermediate Education in Kuwait during the first semester of the 2017/2018 school year. The study sample was selected

purposively, and consisted of sixty sixth-grade male students selected from sections A and B. Section A included 30 students, who represented the control group, whereas section B included 30 students, who represented the experimental group.

Data Analysis

A quasi-experimental, pretest-posttest control group design using a sample of intact groups was utilized in this study. The main purpose of this study was to identify the effect of using e-mind maps strategy on the academic achievement level of the six-grade primary male students in learning Arabic vocabulary compared to the traditional teaching method. The independent variable was the method of instruction which has two levels, the dependent variable of the study was the e-mind mapping posttest scores for each dimension total score, and the pretest was the variance. ANOVA on the post-test total scores with pre-test total scores as a variance was used to determine whether there are differences in improving the Arabic vocabulary skills between the experimental and control groups before and after the intervention. Data analysis was conducted by using Statistical Package for Social Science (SPSS 21.0) and a significance level of .05 was adopted.

Instruments and measures

Two written tests were developed to assess the students' composition before and after the treatment, including the vocabulary test used as a pre-test to determine the learners' level of vocabulary knowledge on the selected texts at the beginning of the research period and a post-test to determine the effect of the mind mapping strategy on developing the students' vocabulary of selected texts. And a four -week interval was allegedly thought to be enough to wash the effect of the pretest on the posttest. The test was applied to the two groups.

Reliability of the study instruments (i.e., the achievement test)

The reliability of the test was checked through the test-retest method. For instance, the study achievement test was distributed to an exploratory sample at the beginning of the second semester of 2017/2018. The latter sample consisted of 27 sixth-grade students chosen from section C of the same school. The test was distributed to these students again after two weeks. The Pearson correlation coefficient was 0.92, which is an acceptable value.

To ensure that the test items are consistent and appropriate for the study participants, the difficulty levels and discriminant coefficients were calculated for each item. The difficulty levels were within the acceptable range (0.32–0.75). The discriminant coefficient values were within the acceptable range (0.36–0.64). Such

values are considered acceptable and suitable for fulfilling the study objectives. The difficulty and discriminant coefficients values are presented in Table 1.

Table 1. The difficulty and discriminant coefficients

Item no.	Difficulty coefficient	Discriminant coefficient
1	0.54	0.36
2	0.43	0.36
3	0.54	0.36
4	0.36	0.43
5	0.43	0.36
6	0.32	0.50
7	0.46	0.36
8	0.54	0.50
9	0.43	0.43
10	0.54	0.36
11	0.54	0.50
12	0.61	0.43
13	0.64	0.43
14	0.50	0.36
15	0.57	0.57
16	0.32	0.57
17	0.61	0.50
18	0.43	0.43
19	0.43	0.43
20	0.57	0.50
21	0.61	0.36
22	0.50	0.36
23	0.32	0.43
24	0.75	0.50
25	0.36	0.43

Discussion of Study Results

The pre-test results regarding the equivalence of both groups in Arabic vocabulary knowledge. To ensure that the two groups had similar levels of Arabic vocabulary knowledge, a t-test was conducted on the pre-test scores. Table 2 shows the t-test results.

Table 2. The t-test results of the pre-test regarding the equivalence
of both groups' Arabic vocabulary knowledge

Group	Arith-metic mean	Standard deviation	T value	Degrees of freedom	Sig.
The control group	8.97	1.40	-0.398	58	0.692
The experimental group	9.10	1.18			

Notably, the statistical significance value is 0.692, which is greater than the statistical significance level a=0.05. Hence, both groups have equivalent levels of Arabic vocabulary knowledge.

Results of testing the study's null hypothesis

The study null hypothesis is as follows:

H0: There are no statistically significant differences (at the significance level of α=05.0) between the achievement levels of sixth-grade control and experimental groups in learning Arabic vocabulary at Kuwaiti schools that can be attributed to the method of learning (i.e., the traditional method or the EMM strategy). To test the study null hypothesis, arithmetic means and standard deviations were calculated for both groups in the pre-test and post-test. The values are presented in Table 3.

Table 3. The arithmetic means and standard deviations
of both groups' Arabic vocabulary achievement levels in the pre-test and post-test,
according to the teaching method

The teaching method	The pre-test		The post-test	
	arithmetic means	standard deviations	arithmetic means	standard deviations
Traditional method	8.97	1.40	15.83	1.26
EMM strategy	9.10	1.18	20.27	1.55
Total	**9.03**	**1.29**	**18.05**	**2.64**

Table 3 reveals a statistically significant difference between the arithmetic means of the two groups in the post-test, in favor of the EMM strategy. To verify this result, one-way ANOVA was conducted, and the results are presented in Table 4.

Table 4. Results of the one-way ANOVA

Sources of variance	Sum of squares	Degrees of freedom	Mean squares	F value	Sig.	Effect size
The pre-test	3.330	1	3.330	1.684	.200	.029
Teaching method	290.758	1	290.758	*147.051**	*.000*	.721
Error	112.704	57	1.977			
Total	**410.850**	**59**				

*It is significant at the level of a=0.05

Notably, the significance of the teaching method variable is 0.000, which is less than the significance level a=0.05. Thus, the null hypothesis is rejected; there are statistically significant differences (at the significance level of α=05.0) between the achievement levels of the sixth-grade control and experimental groups in learning Arabic vocabulary at Kuwaiti schools that can be attributed to the method of learning, in favor of the EMM strategy. Accordingly, it can be concluded that using e-mind mapping in learning Arabic vocabulary had a significant effect on the increase in the level of performance. This result had a significant effect on the increase in the level of performance related to using mind mapping by the students in the experimental group and can be proven through the difference between the post-test means for the two groups, as such means were higher for the experimental group.

The Bonferroni test for post hoc comparisons was conducted to identify which group performed better in the post-test; the objective was to rule out the impact of performance on the test. The results of the Bonferroni test are presented in Table 5.

Table 5. The results of the Bonferroni test for post hoc comparisons for the respondents' achievement level on the Arabic vocabulary post-test, aiming to eliminate the performance impact on the test

The teaching method	The arithmetic mean	Std error	The difference between the two arithmetic means (degree of improvement in achievement)
The traditional method	15.85	0.26	
EMM strategy	20.25	0.26	4.41*

*It is significant at the (α ≤ 0.05) level

The results indicate that there is a statistically significant difference between the Arabic vocabulary achievement levels of those who studied using the traditional method and those who used the EMM strategy. This difference favors those who studied using the EMM strategy (i.e., the experimental group). In addition, the difference between the arithmetic means of the two groups (i.e., the degree of improvement in achievement) is 4.41.

To identify the effect size of the teaching method, the impact on the respondents' Arabic vocabulary achievement levels, the eta square was calculated, with a value of 0.71. Therefore, the EMM strategy improved the students' Arabic vocabulary achievement level at the level of 72.1 %. This finding is not in line with the results obtained by Baek (2011), which demonstrated that mind mapping does not have any impact on students' achievement level before ninth grade because younger students do not have enough knowledge to benefit from mind maps. Unlike the results of this study, many researchers believe that the concept of using the e-mind mapping strategy on students' achievement level in learning vocabulary skills was highly effective, including this study.

Conclusion and Implications

The presented study was conducted to examine the effectiveness of the e-mind mapping strategy in sixth-grade students' achievement level in Arabic vocabulary. The results of this study confirmed that there was a significant increase in the students' achievement level in Arabic vocabulary after the experiment. The statistical analysis of the pre-test scores indicated that the study control and experimental groups showed equivalent levels of knowledge and achievement in Arabic vocabulary. In addition, the study null hypothesis was rejected. Thus, there is a statistically significant difference (at the significance level of $\alpha=05.0$) between the achievement levels of the sixth-grade control and experimental groups in learning Arabic vocabulary at Kuwaiti schools that can be attributed to the method of learning, in favor of the EMM strategy. This conclusion was reached after statistically analyzing the post-test scores. Therefore, the EMM strategy can be considered more effective than the traditional method when teaching Arabic language vocabulary to sixth graders. This finding could indicate that the use of mind mapping software supported students in arranging information in expandable and collapsible topic trees, which enabled them to store much more information without overwhelming them. Moreover, the students had an opportunity to store the contents of the texts in the form of both verbal information and visual images, which may explain the

higher scores in the post-tests given after the students had been involved in mind mapping software activities.

Finally, the results of the presented study indicate the necessity of using e-mind mapping in in teaching Arabic vocabulary. In addition, the results emphasize the significant positive increase in vocabulary skills at the students' achievement level. The present study draws attention to the importance of vocabulary learning and acquisition as a fundamental area for the Arabic language skills.

The finding supports what the literature indicates about the effectiveness of using mind mapping software in developing vocabulary. The findings of this study indicate that using mind mapping software increases students' achievement level, and it can motivate them to continue using the new mind mapping strategy method for learning vocabulary, It developed the students' vocabulary skills, as they expressed their own ideas and transformed them into mind maps of their own creation, thus supporting them in arranging information in expandable and collapsible topic trees. Teachers should employ this strategy to teach Arabic vocabulary because it is more effective than traditional teaching methods. Based on the ed study findings, we as researchers have identified three important recommendations for further research into this area.

1. The Kuwaiti Ministry of Education is encouraged to provide Kuwaiti public schools with computers and special software that can facilitate the application of the EMM to teach Arabic and foreign language vocabulary at those schools.

2. Kuwaiti schools are encouraged to hold more workshops and training sessions about the best methods of applying the e-mind mapping strategy to teach vocabulary efficiently.

3. Future studies should be conducted to identify the effectiveness of e-mind mapping in teaching other aspects of language, such as syntax and reading comprehension.

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