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المجلة العلمية المحكمة لدراسات وبحوث التربية النوعية
المجلد السادس– العدد الأول– مسلسل العدد (١١)– يناير ٢٠٢٠
رقم الإيداع بدار الكتب ٢٤٢٧٤ لسنة ٢٠١٦
ISSN-Print: 2356-8690 ISSN-Online: 2356-8690
موقع المجلة عبر بنك المعرفة المصري https://jsezu.journals.ekb.eg
البريد الإلكتروني للمجلة E-mail JSROSE@foe.zu.edu.eg

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Abstract:

The aim of this study was to investigate the effectiveness of a mind mapping program in developing university stage students' EFL reading comprehension skills impact on. Sixty 1st instruction technology students participated in the study. They were selected and randomly divided into two groups (one experimental and one control). The experimental group was taught using the mind mapping program; whereas the control group was taught using the regular way. One instrument was developed, validated and administered to the two groups before and after applying the proposed mind mapping program. They were a pre-post reading comprehension test. The statistical analysis of data revealed that the experimental group outperformed the control group in the post reading comprehension test. Accordingly, it can be concluded that the proposed mind mapping program was effective in developing the reading comprehension skills of the participants.

Keywords: mind mapping - reading comprehension skills - EFL

Introduction:

Reading comprehension occupies a central role in teaching and learning reading, as well as an essential requirement for academic success. There are various perspectives of approaching reading comprehension. It has been defined in various ways. For example, **Pang *et al.* (2003)** showed that reading consists of two related processes, i.e. word recognition and comprehension. Word recognition is the ability of the reader to recognize how written symbols correspond to one's spoken language, while comprehension is the process of constructing the meaning of words, sentences, and connected text.

From the perspective of reader response theory, reading comprehension can be defined as an event in which the reader, text, and context are in transaction with one another (**Almasi *et al.* 2011**). Thus, meaning resides in the event not just within the reader as a result of decoding print and making inferences. The event consists of the reader, text, and context which participate actively in the meaning making process.

Guthrie *et al.* (2004: P. 193) suggested that "reading comprehension consists of the process of constructing conceptual knowledge from a text through cognitive interaction and motivational involvement with the text." Therefore, conceptual knowledge that EFL readers construct and extract from text is emphasized in comprehension. EFL readers attempt to build concepts and supporting information that are related to each other during reading. This conceptual knowledge varies according to the text genre. EFL readers build concepts and content information related to the topic when reading expository text. They also associate knowledge as the theme, plot, event, etc. when reading narrative texts.

Similarly, **Schiavone (2000)** maintained that comprehension becomes increasingly important as it includes a multiplicity of factors which should be dealt effectively in different grades. It is necessary to recognize the different skills that are needed for understanding the printed page and accessing full meaning through comprehending words as parts of sentences, sentences as parts of paragraphs, and paragraphs as parts of complete writings.

These skills include the ability to: associate meaning with the printed symbols; react to the sensory images suggested by words; interpret the proper denotations and connotations of words; understand the phrase, clause, sentence, paragraph, and total selection; recognize supporting details; identify sequence and organization of a passage; follow directions; recognize relationships: Part-whole, cause-effect, and so forth; interpret figurative language; make inferences and draw conclusions; read critically, to identify the author's intent, purpose, mood, and tone; recognize facts and opinions, or judgments and react to what is read.

In a similar vein, **Aslam (1992)** identified a hierarchy of reading comprehension sub-skills. He added that EFL readers should be able to: recognise the script of a language; deduce the meaning of unfamiliar lexical items; understand explicitly stated information; understand information when not explicitly stated; understand conceptual meaning; understand the communicative value of sentences; understand relations within the sentence; understand relations between parts of text through lexical cohesion devices; understand cohesion between parts of a text through grammatical cohesion devices; recognise indicators in discourse; identify the main point or important information in discourse; distinguish the main idea from supporting details; extract relevant points from a text selectively; use basic reference skills and scan to locate specifically required information.

Furthermore, **Radojevic (2009)** stressed the importance of reading comprehension as it relies on two kinds of information: One is received from the text and the other is retrieved from readers' memory. It is an interactive mental process between readers' previous knowledge and knowledge about a given topic. The knowledge of past experiences and prior knowledge in readers' memory are critical in assisting readers to construct meaning from the text. By relating new ideas encountered in the text to familiar ideas and mental constructions, readers can be engaged in reading different materials successfully and learn new information that is required for success in the EFL setting. Besides, according to **Kim and Anderson (2011: P. 30)**, college students who are more proficient readers are most likely to experience more success in their courses. In this

respect, comprehension can be considered an essential element for successfully completing all college-level courses.

On the same subject, **Al-Abtaan (2005: P. 1)** stated that "reading comprehension occupies an important position in the language teaching programme because of its relevance to EFL learners in their future life, e.g. if they acquire the habits of good reading, they will be able to make good progress in almost every subject they have the opportunity to study." **Klinger *et al.* (2007)** added that although reading has many goals and includes many skills, reading comprehension can be considered the foundation of reading. Reading comprehension distinguishes unskilled readers from skilled ones. Readers with good comprehension skills interact with the text and activate their background knowledge when they read. Thus, an active reader gains the comprehension skills necessary in understanding the complete meaning of words and grasping the concept behind them.

Moreover, **Mikulecky and Jeffries (1996)** asserted that reading comprehension is significant because it contributes to enhance the foreign learners' abilities in learning to think in English; enriching vocabulary; improving writing skills; preparing to study in an English speaking country; and groping their way for new ideas, facts and experiences.

On the other hand, **Cain (2010)** explored the factors that influence the difficulty in reading comprehension. These factors involve vocabulary (unknown vocabulary and the length of words and expressions with misleading meaning); structural difficulty (unfamiliar grammatical structures); text cohesion and coherence; and Knowledge of the world, schemata and assumptions.

Additionally, **Hamra and Syatriana (2010)** showed that different reasons contribute to the difficulties in reading comprehension. These reasons include (a) lack of vocabulary; (b) lack of learning support; (c) lack of language knowledge; (d) pronunciation difficulties; (e) lack of knowledge of words, phrases, paragraphs, and passage or texts; (f) lack of the application of reading strategies; (g) lack of reading skills and reading interest; and (h) lack of reading motivation. On the other hand elements such as grammar, vocabulary, reading strategies, reading attitude and interest can help improve their reading comprehension.

Students can actively overcome their reading comprehension breakdowns by targeting comprehension problems as they occur. They may also use different reading strategies, e.g. using context clues and predicting. They should also be taught knowledge of text organization, and recognize the hierarchical structure of different text types and the

interrelationships among ideas. Moreover, the interaction between the reader and the author depends on the characteristics of the text written by the author. The more ambiguous and complicated the text, the less likely the accordance of ideas realized by the reader and those intended by the author. The possible way of dealing with this is to provide different topics and genres in order to balance the advantages of learners. Teachers should also work on activating prior knowledge and presenting background information related to the topic.

In another attempt, **Tunde–Awe (2014)** examined the relationship between reading attitudes and reading comprehension performance of secondary school students. The participants comprised 800 senior secondary school students sampled from 28 public secondary schools. Two instruments were used, i.e. a reading attitudes questionnaire, which measured learners' attitudes to three types of reading behaviour; and reading comprehension performance test to measure the students' level in reading comprehension. The findings revealed that a total of 65.75% of the students had a generally negative attitude towards reading: 61.13% performed well only at the literal level of reading; 38%; 60% and 65.87% at the inferential, critical, and creative levels, respectively. Also, there was a high, positive and significant relationship between the students' reading attitudes and their reading comprehension performance.

Choosing a sample of middle school language learners, **Rajan & Sam (2013)** investigated the use of graphic organizers for improving understanding of the text. They also examined and proposed different forms of these graphic organizers to develop literal, inferential, and critical reading comprehension skills. Participants were classified into two groups, i.e. control and experimental comprising thirty five each. The reading material used in the study consisted of selected texts from a supplementary reader consisted of both expository and narrative texts. The result of the post-test suggested that the experimental group students' performance was improved in all types of reading comprehension levels compared to the control group students. Therefore, using graphic organizers is effective in reading comprehension.

In the same line **Listia (2012)** conducted a study to improve the students' reading comprehension skills in the literal, inferential, and evaluative levels using collaborative strategic reading. The strategy was implemented in four phases, i.e. preview, click and clunk, get the gist, and wrap up. The participants were 8 th year students comprising 42 students. A reading comprehension test was administered to evaluate the students' level in reading comprehension. The data of the study were obtained from different research instruments, i.e. field notes, observation

sheet, test, and interview. Analysis of data revealed that the implementation of the collaborative strategic reading improved the student's reading comprehension skills in the literal, inferential, and evaluative levels. It also motivated students to be more active and to cooperate with their classmates in following instructions.

For maximizing reading levels, **Alptekin and Ercetin (2011)** examined the effects of working memory capacity and content familiarity on literal and inferential comprehension in second language reading. Sixty-two Turkish students from advanced level English courses participated in the study. A computerized reading test was designed to measure working memory capacity. In addition, content familiarity was considered to reflect the learners' own culture. Genre choice was also carefully considered with the selected readings. Experimental and control groups read either the modified text or the original text and then completed multiple-choice questions that included both literal and inferential comprehension. Findings indicated both significant effects of working memory capacity and content familiarity on inferential comprehension, but not with literal comprehension. It was recommended that the proficiency levels of individual students should also be examined.

Related to the purpose of the previous study, **Vines and Yates (2000)** investigated the impact of the didactic approach and the mantle of the expert approach as a pre-reading experience on inferential comprehension of thematically relevant texts. Twenty-four high school students participated in the study, i.e. eight students were involved in a mantle experience on the theme of slavery, seven students were exposed to a didactic lesson on the same theme, and a further nine students served as the control group. Three inference identification tests were designed to measure inferential reading comprehension.

Results indicated that the didactic and mantle groups had higher scores than the control group, and that the two treatment groups did not significantly differ from each other on the tests. Thus, both the mantle and the didactic treatments enhanced inferential comprehension. The study also demonstrated that those students who participated in the mantle recorded much higher levels of enjoyment of the mode of instruction, than students who experienced the didactic approach.

In the late 60's, mind maps were developed by the British Psychologist Tony Buzan in an attempt to move away from the traditional method of note taking. Buzan used different aspects of mind mapping that may help people create their own note taking in a non-linear fashion. Those mind mapping aspects included using landscape paper, branches, symbols, colors, and central images.

This way a person will use both hemispheres (left and right), thus the brain will be in its peak. **Hofland (2007 and Cited in Sahrawi, 2013, p. 240)** argued that, "mind mapping is a technique that stimulates both parts of the brain, the left side is used for rational and logical thinking whereas the right side is used for creative thinking."

Mind mapping which is also known by many names such as visual mapping, flaw charting, visual thinking and spider diagramming, is according to **Casco (2009: p. 1)** "a graphic tool which contains a central key word or image and secondary ideas that radiate from the central ideas as branches." Moreover, **Buzan (2006: p. 135)** defined it as "a graphic, networked method of sorting, organizing and prioritizing information (usually as paper) using a key or tigger words and images, each of which will "snap on" specific memories and encourage new thoughts and ideas."

Furthermore, mind mapping or visual maps also defines as "a graphic tool used to collect, create, manage and exchange information. It presents information via the special organization of concepts, topics, ideas, words, or other items linked to and arranged in a radial pattern round a central concept" **Krasnic (2011: p. 48)**

According to **Buzan (1994: P. 59)**, "the mind map is an expression of radiant thinking and is therefore a natural function of the human mind. It is a powerful graphic technique which provides a universal key to unlock the potential of the brain."

Mind mapping is a highly effective way of getting information in and out of the brain. It is a creative way of note taking. It uses many pictures, many colors, key words to present ideas and information in clear classification. It also uses association which makes it easier for the information to be remembered because students associate it with information that has already been known. According to **Buzan (1994 p. 59)** mind maps have four basic features; these are:

a. The subject of attention is crystalized in a central image.
b. The main themes of the subject radiate from the central image as branches.
c. Branches comprise a key image or key word printed on an associated lines. Topics of lesser importance are also represented as branches attached to a higher level branches.
d. The branches from a connected nodal structure.

Kacafirkovà (2013) reported in his thesis, that are four important features and characteristics of mind maps. They are:

1. Structure: it is obvious that mind maps support non linearity and it is known for its hierarchical structure.

2. Motivation: motivated students are more interested in the topic they learn and therefore they are willing to devote their time to learning activities, so mind mapping is a great way to increase their attention.
3. Personalization: mind mapping allows students to organize their thoughts and ideas based on their personal experience and feelings.
4. Creativity: mind maps promote creativity since they are connected to art. They revolve around using colors, pictures and symbols which allows students to think creatively.

According to **Buzan (2006)** cited in **Hawrani (2011: P. 17)**, there are many types of mind maps, these are:

1. Dyadic mind maps: those maps are made by drawing to radiant branches in the center.
2. Poly Categoric mind maps: these maps can contain from three to seven branches. Because the average mind cannot remember more than seven pieces of information in the short term memory. One of the advantages of this type is that it helps develop the mental powers of classification and categorization.
3. Group mind maps: it is designed by bringing individuals together in mind mapping groups. According to **Buzan (1994, p. 166),** "the mind map becomes the external reflection, "the hard copy", of the emerging group consensus and subsequently becomes a group record or memory. Through this process, the individual brains combine their energy to create a separate "group brain".
4. Computerized mind maps: these are designed through using computers. There are lots of mind mapping software that help draw careful and cheerful mind maps such as, imind map which was designed by Tony Buzan, Free Mind, Mind Genius, Mind Jet, Nova Mind and lots more.

As mentioned earlier, mind maps can be drawn by hand or using software. When creating a mind map, there are several elements to consider including the maps' central image, colors, branches, image and key words, according to **Buzan (2006: p. 162)**, these elements are as follows:

1. Focus on the core question, the precise topic. Be clear about what it is that you are aiming for or trying to resolve.
2. Turn your first sheet of paper sideways in front of you (landscape-style), in order to start creating your mind map in the centre of the page. This will allow you freedom of expression, without being restricted by the narrow measure of the page.
3. Draw an image in the centre of the blank sheet of paper to represent your goal.

4. Use color from the outset, for emphasis, structure, texture, creativity to stimulate visual flow and reinforce the image in your mind.
5. Now draw a series of thick lines, radiating out from the centre of the image.
6. Curve your lines because they are more interesting to your eye and more memorable to your brain than straight ones.
7. Write one key word on each branch, that you associate with the topic.
8. Add a few empty branches to your mind map. Your brain will want to put something on them.
9. Next, create second-and third-level branches for your related associated and secondary thoughts. The secondary level connects to the primary branches, the third level to the secondary branches, and so on.

As many scientists state, there are many benefits for using mind mapping. **Buzan (1988)** states that, because mind mapping allows such as greater access to human intelligence, multi-national companies are already beginning to use mind maps a tan accelerating rate. Mind mapping is a beneficial learning tool to help students brainstorm topic and think creatively. Furthermore, **Buzan (2003)** states that mind maps can help to remember better, come up with brilliant ideas. In addition to that, they save time and organize thinking. Moreover it gives more fun for students and kids. According to **Jordan & Cornish (2011)**, mind maps can be used individually or in groups. They added that mind mapping helped their students in the following ways:

- Brainstorm and explore any idea, concept, or problem.
- Facilitate better understanding of relationships and connections between ideas and concepts.
- Make it easier to communicate new ideas and thought processes.
- Allow students to recall information easily.
- Help students take notes and plan tasks for more detailed investigation.
- Make it easier to recognize ideas and concepts.

As well, **Buzan (2012)** states that mind maps help in learning, organizing, storing and classifying information easily in order to access instantly. In addition, mind mapping has a whole range of advantages that help make life easier and more successful.

Hussein (2017) investigated the effectiveness of mind maps in developing creative thinking of preschool children. The study adopted the experimental approach. The study sample consisted of (60) children (males and females) divided into an experimental and a control group of (30) children in each. The tools used in the study were: socio-economic

level scale, Goodenough Harris IQ scale, Torrance test of children's creative thinking and mind mapping program prepared by the researcher.

The results of the study indicated that: (1) there are statistically significant differences in the mean scores between both groups in the creative thinking posttest in favor of the experimental group. (2) There are no statistically significant differences in the mean scores of the control group in the creative thinking pre- posttest. (3) There are statistically significant differences in the mean scores of the experimental group in the creative thinking pre- posttest in favor of the posttest. (4) There are no statistically significant differences in the mean scores of the experimental group in the creative thinking post / following up test.

In another attempt, **Abu Diak (2016)** examined the effect of using mind maps and conceptual maps on the achievement and development of creative thinking skills for the sixth grade students in science in Qabatiya. The study adopted the quasi experimental approach and design. The sample consisted of (70) female students. It was divided into (35) students in the experimental group and (35) in the control. The tools used in the study were an achievement test that contained (34) items and a measurement of creative thinking that contained (7) items. The study results revealed that there are statistically significant differences at (α = 0.05) between the average scores in the achievement test in favor of the experimental group. The researcher suggested using mind maps and concept maps in teaching.

Furthermore, **Buran and Filyukov (2015)** sought to describe the use of mind mapping technique in language classrooms. The framework of this study was to conduct the course "General English" taught at National Research Tomsk Polytechnic University, form objectives, design tasks, select mind maps and applying them in the process. The sample of the study contained (50) sophomore technical students. A questionnaire was used as a tool to find out the students' attitudes towards using mind maps.

The results of the study revealed that (90%) of the students developed their skills in reading, writing, plan making, problem solving, preparing presentations and speaking in public. (98%) of the students preferred to use mind maps to capture information rather than reading lengthy boring texts. (2%) found it hard to create a mind map. The results also revealed that the use of mind maps is significant in giving students different opportunities. The study also clarified some of the advantages of using mind maps. For example, it provokes creative thinking and idea generating, it Connects details together, it encourages collaborative work, and the natural, hierarchical structure of mind maps helps to understand a lot of information.

The problem of the study:

First year instruction technology students show a lack of some English reading comprehension skills. This study is a trial to develop those skills via a mind mapping program focusing on the skills validated by the jury members as shown in Table (1).

Table 1. The Reading Comprehension Skills Questionnaire

No.	Levels	Skills	Degree of Importance		
			Very Important	Important	Important to some extent
1	**Literal**	Identify explicitly stated information Identify the details about a specific topic. Identify the main idea stated in the text.			
2	**Inferential**	Compare and contrast. Summarize the gist of the paragraph. Draw conclusion.			
3	**Critical**	Identify the author's purpose. Form personal justified opinions.			
4	**Creative**	Suggest new solutions for problems in the text. Use imagination and experiences to get new insights.			

Questions of the study:

The main question of this study could be stated as the following:

- What is the effectiveness of a suggested mind mapping based program in developing some reading comprehension skills among instruction technology students at the faculty of specific education?

That question was sub-divided as thus:

1. What are the reading comprehension skills required for the 1st year instruction technology students?
2. What are the main features of a mind mapping program to provide students with the opportunities to master the required reading comprehension skills?

3. How far will the mind mapping program effective in developing the students' reading comprehension skills?

The significance of the study:

The results of the study are hopefully expected to be useful for:

1. Students of the 1st year instruction technology in developing their reading comprehension skill of English language.
2. Instructors of English as they would be supplied with a mind mapping program may provide with a list of reading comprehension skills that are appropriate for EFL college students.

The delimitations of the Study:

This study was delimited to:

1. First year Instruction technology students at Faculty of Specific Education.
2. Tenth reading comprehension skills related to literal, inferential, critical and creative levels which are suitable for the students in this stage.
3. A mind mapping program enabled students to read comprehensively for their EFL reading course and other courses.

The hypotheses of the study:

It was hypothesized that:

1. There would be a statistically significant difference between the mean scores of the experimental group and the control group in their performance on the post administration of the reading comprehension skills test in favor of the experimental group.
2. There would be a statistically significant difference between the mean scores of the experimental group in their performance on the pre-and post-administration of the reading comprehension skills test in favor of the post administration.
3. The mind mapping program would be effective in developing 1st year instruction technology students' EFL reading comprehension skills.

Method:

Design:

The study adopted the quasi experimental design; i.e. using experimental and control groups from the 1st year Instruction Technology students. The experimental group was taught using the mind mapping program. At the same time, the control group was continued to study in the regular way.

Participants:

The participants of the study were 1st year Instruction Technology students. They were randomly selected from Faculty of Specific Education and assigned into an experimental group and a control one (30 students for each).

They were relatively at the same age, ranging from 16 to 17 years old, with the same cultural background. Moreover, the proficiency of the students was measured by the pretest revealing that all the students were nearly at the same level.

Instruments:

1. pre-post reading comprehension test: It was developed by the researcher and used as a pre-test to make sure that the students of the experimental and control groups were at the same level before applying the mind mapping program. As a post-test, it was used to identify whether the reading comprehension skills were developed as a result of teaching using the mind mapping program and to determine how far the students could master these skills. It was submitted to a jury of specialists (N=12) in the field of EFL Curriculum and Instruction in order to be judged. The split-half technique was 0.913 and it is considered a fair and reliable result.

Procedures:

At the beginning phase of the study, in an attempt to have homogeneous class, the study participants were given a reading comprehension skills pretest. After making sure that the two groups were at the same level, they were randomly divided into one experimental group and a control group. The experimental group was taught using the mind mapping program and the control group was taught using traditional way. The treatment lasted for 12 sessions from October 27, 2019 to December 4, 2019. Each session took place once a week lasting approximately for 80 minutes. Afterwards, the reading comprehension skills post test was conducted for the two groups. Data were collected and analyzed using SPSS (the Statistical Package for the Social Services).

The results of the study:

1. It was hypothesized that: "There would be a statistically significant difference between the mean scores of the experimental group and the control group in their performance on the post administration of the reading comprehension skills test in favor of the experimental group". A paired sample t-test was used to verify the hypothesis, as shown in Table (2).

Table (2): T-test results of the post administration of the reading comprehension skills test comparing the experimental and the control group

Variables	Maximum Degree	Experimental Group (N=30)		Control Group (N=30)		t	Sig.
		Mean ($\bar{x}$)	Std. Dev. (σ)	Mean ($\bar{x}$)	Std. Dev. (σ)		
Identifying Explicitly Stated Information	6	5.23	1.07	4.07	1.28	3.82	0.00
Identifying Details About Specific Topic	3	2.53	0.68	1.80	0.71	4.07	0.00
Identifying The Main Idea Stated In The Text	6	4.80	1.10	3.40	1.13	4.87	0.00
Literal (Total)	15	12.57	1.92	9.27	1.95	6.60	0.00
Comparing And Contrasting	6	4.80	1.21	3.70	1.44	3.20	0.00
Predicting Outcomes	3	2.93	0.25	1.73	0.87	7.27	0.00
Summarizing The Gist Of The Paragraph	6	5.33	1.03	4.07	1.53	3.76	0.00
Inferential (Total)	15	13.07	1.86	9.50	3.17	5.32	0.00
Identifying Author's Purpose	10	8.23	1.50	7.03	1.61	2.99	0.00
Forming Personal Justified Opinions	5	4.20	0.85	3.23	0.77	4.62	0.00
Critical (Total)	15	12.43	1.74	10.27	1.78	4.77	0.00
Suggesting New Solutions For Problems In The Text	5	3.83	0.91	2.87	1.01	3.89	0.00
Using Imagination And Experiences To Get New Insights	10	8.03	1.07	6.20	1.90	4.61	0.00
Creative (Total)	15	11.87	1.20	9.07	1.64	7.56	0.00
Test (Total)	60	49.93	4.43	38.10	5.38	9.31	0.00

The above table indicates that there was a statistically significant difference at 0.01 level between the attained mean scores of the experimental group and those of the control one in favor of the experimental group in the post administration of the reading comprehension test. The estimated t-value is (9.31) where is significant at (0.01) level in favor of the experimental group.

2. It was hypothesized that: "There would be a statistically significant difference between the mean scores of the experimental group in their performance on the pre and post administration of the reading comprehension skills test in favor of the post administration". A paired sample t-test was used to verify the hypothesis, as shown in Table (3).

Table (3): T-test resul experimental group on the reading comprehension skills comparing the pre and post administration of the test

Variables	Maximum Degree	Pre-Test		Post-Test		t	Sig.
		Mean ($\bar{x}$)	Std. Dev. (σ)	Mean ($\bar{x}$)	Std. Dev. (σ)		
Identifying Explicitly Stated Information	6	2.20	1.16	5.23	1.07	11.10	0.00

Identifying Details About Specific Topic	3	1.20	0.41	2.53	0.68	10.27	0.00
Identifying The Main Idea Stated In The Text	6	2.00	1.20	4.80	1.10	8.57	0.00
Literal (Total)	15	5.40	1.59	12.57	1.92	13.36	0.00
Comparing And Contrasting	6	1.97	1.16	4.80	1.21	8.27	0.00
Predicting Outcomes	3	2.13	0.43	2.93	0.25	9.05	0.00
Summarizing The Gist Of The Paragraph	6	2.30	1.12	5.33	1.03	9.59	0.00
Inferential (Total)	15	6.40	2.03	13.07	1.86	11.49	0.00
Identifying Author's Purpose	10	3.30	1.70	8.23	1.50	9.36	0.00
Forming Personal Justified Opinions	5	1.60	0.72	4.20	0.85	11.41	0.00
Critical (Total)	15	4.90	2.06	12.43	1.74	11.72	0.00
Suggesting New Solutions For Problems In The Text	5	1.40	0.77	3.83	0.91	10.90	0.00
Using Imagination And Experiences To Get New Insights	10	2.83	1.58	8.03	1.07	14.57	0.00
Creative (Total)	15	4.23	1.50	11.87	1.20	21.57	0.00
Test (Total)	60	20.93	4.65	49.93	4.43	19.71	0.00

Table (3) shows that there was a statistically significant difference between the mean scores of the experimental group in the pre and post administration of the reading comprehension skills test. As the mean scores in the pre-test was (20.93) and it raised to become (49.93) in the posttest, the t-value was significant (19.71). This means that the students' reading comprehension skills were developed.

3. It was hypothesized that "The mind mapping program would be effective in developing 1st year instruction technology students' EFL reading comprehension skills".

In order to make sure of the effectiveness of TBIS, Eta Squared and Cohen's Effect Size were used. The results are as follows:

$$\boldsymbol{\eta^2} = \sqrt{\frac{t^2}{t^2 + df}} \qquad \boldsymbol{df} = (n-1) \qquad \boldsymbol{ES = d} = t\sqrt{\frac{2(1-r)}{n}}$$

Table (4): Mind Mapping Effectiveness as shown by Eta Squared and Cohen's Effect Size

Variables	Maximum Degree	T	df	*r*	η^2	*Cohen Effect Size (d)*
Identifying Explicitly Stated Information	6	11.10	29	0.10	0.809	2.7
Identifying Details About Specific Topic	3	10.27	29	0.22	0.660	2.3
Identifying The Main Idea Stated In The Text	6	8.57	29	-0.21	0.718	2.4
Literal (Total)	15	13.36	29	-0.39	0.867	4.1
Comparing And Contrasting	6	8.27	29	-0.25	0.696	2.4
Predicting Outcomes	3	9.05	29	0.08	0.733	2.2
Summarizing The Gist Of The Paragraph	6	9.59	29	-0.30	0.760	2.8
Inferential (Total)	15	11.49	29	-0.34	0.819	3.4
Identifying Author's Purpose	10	9.36	29	-0.62	0.751	3.1
Forming Personal Justified Opinions	5	11.41	29	-0.26	0.818	3.3
Critical (Total)	15	11.72	29	-0.72	0.826	4.0
Suggesting New Solutions For Problems In The Text	5	10.90	29	-0.05	0.816	2.9
Using Imagination And Experiences To Get New Insights	10	14.57	29	-0.06	0.871	3.9
Creative (Total)	15	21.57	29	-0.02	0.922	5.6
Test (Total)	60	19.71	29	-0.58	0.937	6.4

It is obvious that the final value of Cohen's equation for the experimental group is (6.4) which shows high effect that can be attributed to the Mind Mapping Program.

Discussion:

The present study was proposed to study the use of mind mapping program in improving EFL reading comprehension skills for university stage students. For deeper thinking to deal with the results is to investigate the interrelations underlying the variables and practices carried out in this study while conducting the experiment and administering the research instruments. This helped the researcher to understand the apparent improvement in the experimental groups' performance. This advance is caused by the effect of using mind mapping program. This proves that mind mapping is statically and educationally significant in developing the experimental group and student's reading comprehension skills. Thus, in the light of the post- test results of the

present study, the researcher could safely say the program implemented was effective.

Below are some attributions:

- The study participants might have helped to read carefully, critically and analytically in order to construct the mapping and summary. Such reading might helped them not to be afraid of making mistakes and keeping on trying in making mind mapping.
- The instructor focused mind mapping tasks in teaching reading comprehension to promote teaching process. This might have made the learning situation meaningful to the participants and motivate them to learn English.
- The researchers can be used this study as a reference in conducting another researches in reading comprehension and other skills.

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برنامج مقترح بإستخدام الخرائط الذهنية لتنمية بعض مهارات الفهم القرائي لدى طلاب تكنولوجيا التعليم بكلية التربية النوعية

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ملخص الدراسة:

هدفت الدراسة إلى تحديد فاعلية برنامج مقترح قائم على استخدام الخرائط الذهنية لتنمية مهارات الفهم القرائى باللغه الانجليزيه لطلاب المرحلة الجامعية. شملت عينة الدراسة ٦٠ طالب بالفرقة الاولى شعبة تكنولوجيا التعليم كلية التربية النوعية، وتم اختيارهم وتقسيمهم عشوائيا إلى مجموعتين (مجموعة تجريبية وأخرى ضابطة). تم التدريس للمجموعة التجريبية بإستخدام برنامج الخرائط الذهنيه بينما تم التدريس للمجموعة الضابطة بالطريقة المعتادة. وتضمنت أدوات الدراسة إختبارالفهم القرائى . وقد أوضحت نتائج تحليل البيانات إحصائيا تفوق المجموعة التجريبية على المجموعة الضابطة فى إختبار الفهم القرائى البعدي. وعليه يمكن إستخدام برنامج الخرائط الذهنية فى تنمية مهارات الفهم القرائى باللغه الانجليزية.

الكلمات المفتاحية: الخرائط الذهنيه - مهارات الفهم القرائى - اللغة الانجليزية كلغة أجنبية