

Zagazig University
Faculty of Education
Curriculum, Instruction and Educational Technology Department

**Using Concept Mapping Strategy to Develop Reading Comprehension Skills of
EFL Prep Language School Pupils**

By
Mohamed Essam Mahmoud Mohamed

Supervised by
Dr.

Eman Al-Bashbishy
Professor of Curriculum&Instuction (TEFL)
Faculty of Education
Zagazig University
Profeman779@yahoo.com

Dr.
Ahmed Abd Abd ElSalam Edrees
Lecture of Curriculum&Instruction (TEFL)
Faculty of Education
Mansoura University
Aedries@zu.edu.eg

**Using Concept Mapping Strategy to Develop Reading Comprehension Skills of
EFL Prep Language School Pupils**

By

Mohamed Essam Mahmoud Mohamed

Supervised by

Dr.

Eman Al-Bashbishy

Professor of Curriculum&Instuction (TEFL)

Faculty of Education

Zagazig University

Aedries@zu.edu.eg

Dr.

Ahmed Abd Abd ElSalam Edrees

Lecture of Curriculum&Instruction (TEFL)

Faculty of Education

Mansoura University

Profeman779@yahoo.com

Abstract

The purpose of the study was to investigate the effectiveness of using concept mapping strategy to develop reading comprehension skills among EFL preparatory language school selected from Hehia Language School in pupils. The participants Hehia at Sharkia Governorate. They were divided into two groups, the experimental group (N=35) and the control group (N=35). The communicative pre test was administered to the participants before the treatment. The experimental group was taught the concept mapping strategy while the control group was taught using the traditional method. The communicative posttest was administered to both groups. Results of the study revealed that using concept mapping strategy was effective in developing reading comprehension skills among the preparatory stage pupils.

Key words: Concept mapping strategy and reading comprehension.

"استخدام استراتيجية خرائط المفاهيم لتنمية مهارات الفهم القرائي لتلاميذ المرحلة الاعدادية لمدارس اللغات"

إعداد

محمد عصام محمود محمد

د. أحمد عبدالسلام إدريس مبارك
مدرس المناهج وطرق التدريس
كلية التربية-جامعة الزقازيق

أ.د. ايمان محمد على البشبيشى
أستاذ المناهج وطرق التدريس اللغة الانجليزية
كلية التربية-جامعة المنصورة

ملخص الدراسة

هدفت الدراسة الحالية الى تحقيق فاعلية استخدام استراتيجية خرائط المفاهيم لتطوير مهارات الفهم القرائي بين تلاميذ المرحلة الاعدادية لمدارس اللغات. تكونت عينة الدراسة من (٧٠) طالبا وطالبة بمدارسه مجمع لغات ههيا بههيا بمحافظة الشرقية. وقسمت العينة الى مجموعة تجريبية وعددها (٣٥) طالبا ومجموعة ضابطة وعددها (٣٥) طالبا. ودرست المجموعة التجريبية باستخدام استراتيجية خرائط المفاهيم وبينما قامت المجموعة الضابطة بدارسه نفس المحتوى بالطريقة التقليدية. تم تطبيق اختبار مهارات الفهم القرائي فى اللغة الانجليزية قبل وبعد تطبيق استراتيجية خرائط المفاهيم. واطهرت نتائج الدراسه فاعلية تطبيق استراتيجية خرائط المفاهيم، حيث ان نتائج المجموعة التجريبية كانت افضل من نتائج المجموعة الضابطة فى مهارات الفهم القرائي لدى طلاب المرحلة الاعدادية.

الكلمات المفتاحية: استراتيجية خرائط المفاهيم والفهم القرائي

Introduction

Reading comprehension is a significant language skill integral to overall language development; language comprehension is dispensable for all language and thinking skills and it is the ultimate goal of literacy (Ortlieb, 2013). The development of reading comprehension skills is essential for success in academic achievement.

Reading comprehension is defined by (El-deen, 2009) as the ability to communicate a text leading an integrated process that involves decoding vocabulary and sentences, employing prior knowledge relevant to the text and using cognitive and meta cognitive strategies in order to make sense and to get the target message the author wants to convey. Elradii (2014) concluded that reading comprehension was the reader's ability to interact with a text to construct meaning or to convey the author's message through employing an integrated process that involved cognitive and meta cognitive strategies. In other words, reading comprehension was the process of interacting with the text using different reading comprehension skills.

Reading comprehension is a skill required for higher order thinking skills by readers. It is to extract meaning presented in the reading text through meaning construction and interaction with the written text. To achieve reading comprehension, there is a need for an interaction between three main elements, which should be intertwined concurrently; the reader, the doer of the comprehension, the reading text to be comprehended and finally the reading

activity- in which comprehension was an element of the process(Zablocki, 2017).

Hunt (2004, p. 137) defined reading as "a process shaped partly by the text, partly by the reader's background, and partly by the situation the reading occurs in". According to the previous definition, the reader has an interactive role because he does not simply find information from the text, but he has to activate his background knowledge remembering similar situations, and working with the text to recreate the exact meaning. In other words, the reader has to negotiate the meaning with the author based on shared or common knowledge. As such, teachers are advised to explain the purpose of reading to their pupils and encourage them to ask a set of questions before reading such as why they need to read the current text, what they need the text for, and what they are expected to do with the text after reading (Hermida, 2009).

Fairbairn and Fairbairn (2001, p.16) defined reading as "a complex set of different activities requiring a range of skills". They indicated that this complexity, is exhibited in a range of ways, for example, a teacher who teach his/her students to read starting from letters, syllables, then words, and who follows a 'sound out' approach, will have a distinct conception of reading than one who promotes reading words as a whole and advocate a 'look and say' approach. Efficient reading enables readers to search for new information, expand their knowledge, and learn new things in different viewpoints and perspectives. Souhila (2014) indicated that reading is a constructive process by which learners develop their

linguistic, sociolinguistic, and cultural knowledge. Lipka and Siegel (2011) described reading process as a 'multi-dimensional process' that comprises the text, the reader, and other factors connected to the activity of reading.

Lipka and Siegel (2011) indicated that reading proficiency requires students to comprehend various texts at a high level of proficiency. Reading comprehension is a complicated process where meaning is a combination of both literal meanings of words and the embedded meanings that need to be inferred by the reader (Maria, 1990). Bråten and Strømsø (2011) indicated that reading comprehension is a joint effort between both the author and the reader of the text. The author has to frame an interpretable text meanwhile the reader has to mobilize multiple skills and knowledge to comprehend the text. They continued that as the reader grows older, the tasks of comprehension become more difficult and demanding. Most of school curriculum areas require readers to read and understand written texts. As reading is an active process that aims to search for meaning, reading comprehension is very crucial and therefore it should be approached thoroughly. As such, making inferences from the text needs explicit training on answering different comprehension questions (Hansen and Pearson, 1983).

The purpose of pupils' reading plays an essential role on the quality of reading comprehension, that is, in some cases, the learners have to grasp information that is mentioned directly or literally so they do not have to draw much attention or make inferences from the text. In other cases, they have to infer things

that are not mentioned directly in the text, as a result, they have to read critically or analytically. Fairbairn and Fairbairn (2001) differentiated between reading for pleasure – where the focus is on the reading process itself and the reader is interested in gaining pleasure and discovering a new imaginative world in one hand, and between reading for academic purposes – where readers are interested in finding or understanding certain information, ideas or arguments.

Reading comprehension is one of the basic activities done in every language classroom for a number of reasons:

1. It functions as a means of increasing learners' knowledge of the language being learnt (Behjat, 2011).
2. It gives the big contribution to students to perform their communication skills better (Afida, 2008).
3. It is one of the most frequently used language skills in everyday life, as witnessed by the use of the internet (Medina, 2012).
4. It helps learners construct meaning by focusing on the relevant features of a text and to relate those features to their prior experiences (Cooper & Au, 1997).
5. It helps the reader to find meaning in what is read (Mohamad, 1999).

Concept mapping was an increasingly popular teaching and learning tool at all levels of education. Concept mapping is graphical tools used for organizing and representing knowledge (Novak & Cañas, 2008). Concept mapping was first

explored by Joseph Novak and his research team at Cornell University in the 1970s as a graphic means of expressing scientific concepts to young children. Since then, concept mapping had been employed in a wide variety of settings and contexts, particularly but not exclusively in education. Through concept mapping learners were able to externalize their existing knowledge and combined it with new knowledge and then rearranged and internalized both the old and new knowledge in a graphic form. The primary features of concept mapping are its hierarchical structure which identifies specific concepts, usually enclosed in circles or boxes, and in the connecting lines between them. The most general and inclusive concepts were placed at the top of map, while the secondary concepts were placed below with the cross linkages and relationships between concepts indicated by lines(Wang, Lee, & Chu, 2010).

In educational contexts concept mapping were used as tools for facilitating students understanding of conceptual knowledge by creating a graphical map of that knowledge which helped the learner to make a deep systematic analysis of a learning topic(Vural & Zellner, 2010). The information in a concept mapping was easily accessed by looking at how each word or concept relates to each other. This made concept mapping useful for visual learners who memorized information more easily from images and pictures(Cicognani, 2000). The presentation of information in a graphical manner was thought by many educational theorists to help

learners to understand and retain conceptual knowledge in a more meaningful way than rote learning.

The use of concept mapping is some sort of advance organizers that assist in mental visualization that helps in reading comprehension, retaining and retrieving information (Buzan & Buzan, 1996; Tucker, Armstrong & Massad, 2010). Concept mapping can efficiently be used as scaffolds for higher-order mapping not only helps in thinking skills (Holzman, 2004). Concept improving and organizing learning, but it can also help in enhancing long-term memory retrieval as well as cognitive processing of oral material (Farrand, Hussain & Hennessey, 2002). Concept mapping was used to communicate complex ideas and summarized information that were used for collaborative learning and for assessment and evaluation. Concept mapping had been shown to help learners to learn, researchers to create new knowledge, administrators to better structure and manage organizations, writers to write, and evaluators to assess learning (Novak & Cañas, 2008). Concept mapping had also been used as advance organizers and as a curriculum development tool (Stoica, Moraru, & Miron, 2011).

Crane (1998) argues that concept mapping helps their users see their essays as a series of ideas rather than a mere string of words divided by punctuation marks. They also help writers see new connections and novel meanings that they didn't see before drawing their maps. Moreover, it is much easier for teachers to discuss with their students who have a large amount of in-sequential rough notes. These maps will help pupils see the big

image throughout the discussion and not only focus on sentence-level errors. Moreover, Novak and Cañas (2006 & 2008) believe that the hierarchical structure for a specific area of knowledge relies on specific context particular to that knowledge. Therefore, when constructing a concept mapping, it is advisable to define the context and to have a specific question for the learners to search for an answer. This question is called “a focus question”. Kinchin (1998) states that concept mapping depicts knowledge to answer the) points out that the first step in ·focus question. Novak (1999) creating a concept mapping is to construct the focus question. He argues that a good and specific question guides pupils to build a good map that holds key concepts. Antoniazzi (2005) argues that teachers should be setting a good question. This question should also conform to the students’ interests and capacities. It should trigger a definite reaction so as to keep them focused on one area. Moreover, it should be authentic which means it must be related to classroom work, syllables and the real world and enable them to join old knowledge with new.

Thus, the present study attempted to use concept mapping strategy for developing the second-year preparatory language school pupils reading comprehension skills and improving their attitudes towards reading texts in English.

Statement of the Problem

Based on the review of the literature, the pilot study and the researcher’s experience as a teacher of English the problem of the study can be stated on the poor performance of the second-year

preparatory language school pupils in reading comprehension skills. Therefore, the present study is an attempt to investigate the effectiveness of utilizing concept mapping strategy to develop reading comprehension skills among the second-year preparatory language school pupils.

Questions of the Study

The present study is an attempt to answer the following questions:

1. What are the reading comprehension skills required for the EFL preparatory language school pupils?
2. What are the features of a concept mapping strategy used to develop the EFL preparatory language school pupils' reading comprehension skills?
3. What is the effectiveness of this strategy on developing the EFL preparatory language school pupils' reading comprehension skills?

Delimitation of the Study

The current study is limited into the following:

1-Seventy of the second-year preparatory language school pupils.

2-Some reading comprehension skills. (Literal, Inferential, Critical and Creative skills)

3- Concept mapping strategy.

Design

The study will adopt the quasi-experimental design. The participants will be divided into two groups: experimental and

control group. The experimental group will receive the treatment using concept mapping strategy, whereas the control group will be taught according to the conventional method of teaching reading.

Hypotheses of the Study

The current research aims at testing the following hypotheses:

1. There are statistically significant differences at the (0.05) level between the mean score of the pupils of the experimental group and control group in the post-test of the reading comprehension as a whole and in its sub-skills. In favor of the experimental group.
2. There are statistically significant differences at the (0.05) level between the mean scores of the pupils of the experimental group in the pre and post-test of the reading comprehension test as a whole and in its sub-skills, each separately, in favor of the post-test.
3. There is a correlation at a level between the scores of the experimental group pupils in the post application of the reading comprehension test, the researcher used Pearson correlation coefficient, the (SPSS.Ver, 22) program.

Instruments of the Study

To achieve the purpose of the current study, the researcher use:

- A. A reading comprehension skills checklist.
- B. A reading comprehension test.

Participants of the Study

Participants were EFL second year preparatory language school pupils (Hehia English School- Preparatory Stage), Hehia

Educational Administration, Al-Sharkia Governorate. The 0 male and female pupils. The researcher selected a sample comprising pupils. The participants were divided into two equal groups of 3 each. The experimental group and the control group.

Procedures of the Study

1. After the participants in the research has been selected, the participants were divided into two groups, the experimental group (N=35) and the control group (N=35).
2. The pre- reading comprehension test was administered to the participants before the treatment.
3. The experimental group taught using concept mapping while the control group was taught using the traditional method.
4. The post reading comprehension test was administered to the both groups.

Findings of the Study

The results of the study will be presented in the light of the following hypotheses:

The first hypothesis states that **“There are statistically at the (0.05)level between the mean significant differences scores of the pupils of the experimental group and control group in the post-test of the reading comprehension as a whole and in its sub-skills, each separately, in favor of the experimental group.”**

The researcher used the independent samples t-test to measure the differences between the mean scores of the

experimental group and the mean scores of the control group in the post-test of the reading comprehension, using the (SPSS Ver 22).

Table (1) shows these results.

Table(1):The value of (t) and its statistical significance, and the values of (η^2), (Effect size), and the amount of the effect of the experimental treatment on the development of the reading comprehension as experimental and control group pupils in the post- a whole and its sub-skills each separately among the test.

Effect size	Effect Size value	η^2 value	t value	Experimental group n = 35		Control group n = 35		skill
				SD. Deviation	Mean	SD. Deviation	Mean	
very high impact	3.525	0.756	14.536*	0.63113	9.6857	2.02007	4.4857	Literature Comprehension
very high impact	4.085	0.806	16.841*	0.73907	14.5714	2.61765	6.8286	Inferential Comprehension
very high impact	2.917	0.680	12.029*	0.79600	9.3143	2.08758	4.7714	Critical Comprehension
very high impact	3.382	0.741	13.946*	0.54695	6.7714	1.26889	3.5143	Creative Comprehension
very high impact	6.134	0.904	25.294*	1.73108	40.3429	4.53224	19.6000	The test as a whole

*significant at the (0.05) level

It is evident from table (1) that:

1. There are statistically significant differences the mean scores of the experimental group and control group pupils at the reading comprehension test as a (0.05) level between in the post whole, and all of its skills in favor of the experimental group.
2. The T. computed value of the test as a whole is statistically significant at the (0.05) level. It reached (25.294) which is greater

than the tabular (t) value (2.03), and all (t) values calculated for each skill of the test is statistically significant at (0.05) level. This indicates that the pupils of the experimental group differed from the students of the control group in the post-test.

3. After comparing the (Effect Size) value with the table (1) proposed to determine the levels of the effect size (Saad Abdel Rahman, 2009, 136), we found that the effect size is significant in each skill of the reading comprehension, as well as in the overall result of the test. This result indicates that utilizing a strategy based on concept mapping in the teaching of the experimental group is more effective than using the traditional method in developing the pupils' reading comprehension skills.

Table (2): Effect volume levels

large	medium	small	Impact
greater than 0.8	0.5 to 0.8	0.2 to less than 0.5	Effect size D

verify

To

the validity of the second hypothesis, which was stated that:
“There are statistically significant differences at the (0.05) level between the mean scores of the pupils of the experimental group in the pre and post-test of the reading comprehension test as a whole and in its sub-skills, each separately, in favor of the post-test.”

The researcher used the Independent Samples t-test to measure the differences between the mean scores of the experimental group in the pre and post-test of the high order reading comprehension. Table (3) shows the results.

Table(3):The value of (t) and its statistical significance, and the values of(η^2), (Effect size), and the extent of the effect of the experimental treatment on the development of the reading comprehension as a whole and its sub-skills each separately among the pupils of the experimental group between the pre and .post-tests

Effect size	Effect Size value	η^2 value	t value	the post-test n = 35		the pre-test n = 35		skill
				SD. Deviation	Mean	SD. Deviation	Mean	
very high impact	9.413	0.956	27.445*	0.63113	9.6857	1.31699	2.8286	Literature Comprehension
very high impact	11.341	0.969	33.067*	0.73907	14.5714	1.80801	3.7143	Inferential Comprehension
very high impact	7.929	0.940	23.117*	0.79600	9.3143	1.27813	3.1143	Critical Comprehension
very high impact	5.241	0.872	15.280*	0.54695	6.7714	1.24819	2.9714	Creative Comprehension
very high impact	16.623	0.986	48.464*	1.73108	40.3429	2.87060	12.6286	The test as a whole

*Significant at the 0.05 level

It is evident from table (3) that:

1. There are statistically significant differences at the (0.05) level between the mean scores of the experimental group pupils in reading comprehension test as a whole, and all of -the pre- and post its skills in favor of the post-test.
2. The t .value of the test computed as a whole is statistically significant at the level (0.05). It reached (48.264) which is greater than the tabular (t) value (2.03), and all (t) values calculated for each skill of the test is statistically significant at level (0.05). This indicates that the superiority of the experimental group pupils in the

post-test than their performance in the pre-test of the reading comprehension test.

3. After comparing the (Effect size) value with the table (3) proposed to determine the levels of the effect size (Saad Abdel Rahman, 2009, 136), we found that the effect size is significant in each skill of the reading comprehension, as well as in the overall result of the test. This result indicates that utilizing a strategy based on concept mapping in the teaching of the experimental group is more effective than using the traditional method in developing the pupils' reading comprehension skills.

To verify the validity of the third hypothesis, which was stated that: **“There is a positive, statistically significant correlation at a level between the scores of the experimental group pupils in the post application of the reading comprehension test, the researcher used Pearson correlation coefficient, the (SPSS.Ver, 22) program and a table (4) explains.”**

Table (4): correlation between the high order reading comprehension skills

Significance level	correlation coefficient	The variable
0.05	0.391	Reading Comprehension

Conclusion

The present study attempted to develop the EFL reading comprehension skills among second-year preparatory language

school pupils through using concept mapping strategy. The results of the current study proved the effectiveness of concept mapping strategy in developing reading comprehension skills among second-year preparatory language school pupils. Therefore, concept mapping strategy is recommended for 2nd year preparatory language school pupils to develop their reading comprehension skills.

Suggestion for Further Research

Based on the results of the present study, the researcher can recommend and suggest the following:

- Conducting studies based on using concept mapping strategy to improve the other language skills such as writing and speaking.
- Conducting studies that help preparatory pupils in their reading improvement and progress.
- Examining the impact of concept mapping strategy in improving pupils' using of language as a whole.
- Conducting studies that find the relationship between concept mapping strategy on reading comprehension for both pupils and teachers.

References

- Afida, A. (2008). *Improving students' reading comprehension using reciprocal questioning technique: A classroom action research in SMK Diponegoro Salatiga in 2007/2008 Academic year*, master 's thesis, Sebelas Maret University. Retrieved from: [http://eprints.uns.ac.id/8104/1/74251007200903171 .pdf](http://eprints.uns.ac.id/8104/1/74251007200903171.pdf)
- Antoniazzi, M. (2005). Prewriting in E F L. *Revista Enfoques Educativos*. Universidad de Chile, Iran, 7 (1): 35 – 49.
- Behjat, F. (2011). Reading through interaction: From individualistic reading comprehension to collaborating, *Theory and Practice in Language Studies Journal*, 1(3), 239-244.
- Bråten, I & Strømsø, H. (2011). *Measuring strategic processing when students multiple texts. Metacognition Learning*, 6(2), 111-130. DOI: 10.1007/s11409-011-9075-7read
- Buzan, T., & Buzan, B. (1996). *The mind-mapping book: How to use Radiant Thinking to maximize your brain's untapped potential*. London: BBC.
- Cicognani, A. (2000). Concept mapping as a collaborative tool for enhanced online learning. *Journal of Educational Technology & Society*, 3(3), 150-158 .
- Cooper, T., Pikulski, J. & Au, K. (1997). *Early Success. An Intervention Program*. Boston: Houghton Mifflin.
- Crane, M. (1998). Writing away! Out of chaos: Using concepts maps to re- envision students writing. *The University of Louisville's writing across the Curriculum Newsletter*, 3(4).
- El-deen, Z. (2009). *The Effectiveness of Assisted Extensive Reading on Developing Reading Comprehension Strategies for*

Ninth Graders in Gaza Governorate. The Effectiveness of Assisted Extensive Reading on Developing Reading Comprehension Strategies for Ninth Graders in Gaza Governorate .

- Fairbairn, G. & Fairbairn, S.(2001). *Reading at university: A guide for students*.
- Farrand, S., Hussain, F. & Hennessy, E. (2002). The efficacy of the mind map study technique. *Journal of Medical Educational*. 36(5), 426-431. Retrieved October 12, 2013 from: <http://www.thinkbuzan.com/uk/articles/mindmappingworks>
- Hansen, J., & Pearson, P. (1983). An instructional study improving the inferential comprehension of good and poor fourth-grade readers. *Journal of Educational Psychology*, 75, 821-829.
- Hermida, J. (2009). The Importance of Teaching Academic Reading Skills in First-Year University Courses, *The International Journal of Research and Review*, 3(1). 20-30. Retrieved 26 May 2018, from <https://ssrn.com/abstract=1419247>.
- Holzman, S (2004). Thinking maps: Strategy-based learning for English language learner. Annual Administrator Conference 13th Closing the Achievement Gap for Education Learner Student, Sonoma Country Office of Education, California Department of Education.
- Hunt, R. (2004). Reading and writing for real: Why it matters for learning. *Atlantic Universities' Teaching Showcase*, 55, 137-146.
- Kinchin, I. (1998). Constructivism in the classroom: mapping your way through. School of Educational Studies, University of Surrey, Guildford, Surrey GU2 5XH, UK. Paper presented at

the British Council Research Associations. Annual Research Student Conference. The Queen's University of Belfast.

- Lipka, O; and Siegel, S (2011). The Development of reading comprehension skills in children learning English as a second language. *The Journal of Springer Science & Business Media B.V.* 25(8), 1873-1898. Doi: 10.1007/s11145-011-9309-8.
- Maria, K. (1990). *Reading comprehension instruction: Issues & Strategies*. Maryland: York Press.
- Medina, S. L. (2012). "Effects of strategy instruction in an EFL reading comprehension course: a case study." Teachers' *Professional Development Journal*, profile 14 (1). Retrieved from: <http://www.sci.unal.edu.co/scielo.php?script=Sciarttext&pid=S1657-07902012000100006&lng=en&nrm=iso>
- Mohamad, A. (1999). What do we test when we test reading comprehension? The Internet *TESL Journal*, 12, 1-2. Retrieved from: <http://itesl.org/techniques/Nunn-Interacting.html>
- Novak, J. & Canas. (2006). The Origins of the Concept Mapping Tool and the Continuing Evolution of the Tool. *Information Visualization Journal*, 5 (3). 175-184.
- Novak, J. D., & Cañas, A. J. (2008). The theory underlying concept maps and how to construct and use them .
- Novak. J. D. (1990). *Helping Students How to Learn: A View From A Teacher- Researcher* [1]. Ithaca, NY: Cornell University.
- Ortlieb, E. (2013) Using Anticipatory Reading Guides to Improve Elementary Students' Comprehension. *International Journal of Instruction*, 6 (2), 145 -162.

Philadelphia: Open University Press.

- Saad Abdel Rahman: (2009) “Psychological Measurement Theory and Practice”, 5th edition, Giza, Heba El Nil for Publishing and Distribution.

- Souhila,R.(2014).*The Use of Reading Strategies in Improving Reading Comprehension*. Unpublished Master Thesis, Ouargla, Algeria: University of Kasdi Merbah Ouargla.

- Stoica, I., Moraru, S., & Miron, C. (2011). Concept maps, a must for the modern teaching-learning process. *Romanian Reports in Physics*, 63(2), 567-576 .

- Tucker, J. M., Armstrong, G. R., & Massad, V. J. (2010). Profiling the mind map user: A descriptive appraisal. *Journal of Instructional Pedagogies*, 2(4), 1-13.

- Vural, Ö. F., & Zellner, R. (2010). Using concept mapping in video-based learning. *Gaziantep University Journal of Social Sciences*, 9(3), 747-757 .

- Wang, W.-C., Lee, C.-C., & Chu, Y.-C. (2010). A brief review on developing creative thinking in young children by mind mapping. *International Business Research*, 3(3), 233 .

- Zablocki, M., Horn, B. & Cuenca-Carlino, Y. (2017). Effects of reciprocal teaching strategies on the reading comprehension of adolescents at an alternative school. *Illinois Reading Council Journal*, 11-23.