International Journal of Education and Cognitive Sciences
Volume 2, Number 3, 18 - 22, October 2021
https://iase-ijeas.com
ISSN: 3041-8828

Mind-Mapping Technique as a Learning Tool for Epidemiology of Common Diseases Course among Public Health Students

Maria Cheraghi[1]*, Morteza Khafaie[1], Heshmatollah Tavacol[2], Zahra Rahimi[3], Ali Asghar Arastoo[1]

1- *Associate professor, Social Determinant of Health Research Center, Department of Public Health, School of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.*
2- *Faculty Member, Department of Internal Medicine, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.*
3- *Employee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.*

Keywords:
Mind-Mapping Technique
Epidemiology
Ahvaz
Iran

Professors can apply many techniques to teach their students. One of these techniques is Mind Mapping that has many advantages. One of the most important advantages of using this technique is to activate both hemispheres of brain to remember the content easily. This study aimed to assess the Mind Mapping technique as an alternative method in the epidemiology of common diseases course. The epidemiology of common diseases lesson was taught using Mind-Mapping technique during fourteen sessions. To assess the efficacy and desirability of this technique compared to other traditional methods, the scores obtained by the students those were taught based on Mind-Mapping technique during two years were compared to ones obtained by those who were taught this lesson based on other techniques. In descriptive statistics, mean and standard deviation and in analytic statistics, independent t-test was used. Data analysis was performed using SPSS software version 23. In the first group (n: 41 people), the mean and standard deviation of the students' scores in the common epidemiology was 1390±2.59 before applying the Mind-Mapping technique. During two years, Public Health under graduates were taught using the Mind-Mapping technique. In the first year, in the second group (n: 33 people), the mean and standard deviation was 16.91±1.82 and in the third group (n: 39 people), in the second year, it was 16.05±1.58. To compare applying the traditional teaching methods to applying Mind-Mapping technique, a statistical significant difference was shown (respectively $P<0.001$ and $P<0.001$). This study and other studies have shown positive effects of applying Mind-Mapping technique in teaching epidemiology lesson.

*** Corresponding author Email: mariacheraghi@gmail.com**

Introduction

One of the most important skills that is required by professors to encourage students to participate in the class is developing some creativities and diversities which can refresh the environment of the class and encourage professors to create and find new situations and ideas to assist the students in understanding and memorizing the content(Betancur & King, 2014).

It has been discovered that thinking is not a linear phenomenon. As the content is presented in a visual way, it can be understood better(Betancur & King, 2014) .

Based on the Buzan theory(T. B. Buzan, Barry, 1993), during the learning process, first, our brain remembers those things which are in relationship with something tangible. Accordingly, Buzan proposed a technique, named mind mapping, by which students can be able to work with words and build the relationships between them. This technique can improve some specific functions of brain including storing, analyzing, retrieving and controlling information and concepts.

A Mind Map is a graphical organization in which the main titles are shown related to a main idea and the subtitles are displayed like the branches coming out of the bigger ones. This visual tool can be used in spreading ideas, taking notes, organizing thoughts, and developing imaginations(Al-Jarf, 2011). This technique assists students in prioritizing and integrating the material presented during a course(Zipp, Maher, & D'Antoni, 2009) .

To design a Mind Map seven stages should be considered. 1) Starting from the middle of a piece of paper and designing the map horizontally; why? Because starting the work from center allows your brain to spread in various directions and show its capabilities more freely. 2) Using a photo or picture for the main topic; why? Because each photo or picture values as one thousand words and it can activate your imagination. 3) Using colors; why? Because colors are interesting and motivating as photos for your brain. 4) Drawing the main lines and branches from the center towards out and connecting the secondary branches to the main ones; why? Because our brain functions by connecting the contents and materials to each other. When you connect the lines and branches to each other, learning and storing the information can happen more easily. 5) Using crooked lines instead of straight ones; why? Because straight lines are boring for brain. 6) Using one key work in each line; why? Because such words give more power and flexibility to your mind. 7) Using more pictures; why? Because like the main picture, other ones are also as valuable as one thousand words(T. Buzan, 2006).

The common epidemiology lesson is considered as one of the difficult lessons for the students due to the numerous topics, similar symptoms and various diseases. That is why most of the students do not get high scores in this lesson. This study aimed to assess the effect of applying Mind Mapping technique on increasing the level of scores and learning rate in epidemiology of common diseases course among Public Health students.

Methodology

Teaching Epidemiology of Common Diseases Using Mind-Map Technique

The subjects of this study were under graduates of Public Health in Ahvaz Jundishapour University of Medical Sciences. In this study, the headings of epidemiology of common diseases course were investigated. This lesson was presented in fifteen sections. During the semester, two two-hour sessions were hold to make the students familiar with the Mind Mapping technique and its advantages and then the students were taught the epidemiology of common diseases based on the Mind Mapping technique by the professors. To assess the desirability and efficacy of this technique, the students' scores in the epidemiology of common diseases course were compared to those obtained from the students who were taught based on the traditional techniques during two years. In descriptive statistics, mean and standard deviation

and in analytic statistics, independent T-test was used. The data were analyzed in SPSS software version 23.

Results

Before applying Mind Mapping technique, in the first group (n: 41 people) mean and standard deviation of the students' scores in the common epidemiology lesson was 13.90±2.59. During two successive years, Public Health undergraduates were taught based on the Mind Mapping technique. In the first year (the second group (n: 33 people)), the mean and standard deviation of the students' scores in common epidemiology course was 16.91±1.82. In the second year (the group (n: 39 people)), the mean and standard deviation of the students' scores in this lesson was 16.05±1.58. Independent t-test was used to calculate the difference between teaching based on traditional techniques and Mind Mapping (respectively, $P<0.001$ and $P<0.001$)

Discussion

In the present study, the average score of those were taught epidemiology of common diseases based on Mind Map was significantly higher than that in another group. Most studies conducted in regard of applying Mind Mapping technique in teaching various lessons, have shown positive effects of this technique.

The study conducted by Reima Al-Jarf (Al-Jarf, 2011) showed that using Mind Map software in EFL course helped the students to separate the sounds of vowels, adding silent e at the end of the words, vowels with more than one sound, hidden sounds, the rules for adding appendices, similes, merging and abbreviations.

The results obtained from the study conducted by T. Tungprapa (Tungprapa, 2015) on postgraduates of teaching college of Ramkhamhaeng university in Thailand, showed that using electronic Mind Map technique was positive and it could increase the students' motivation to study the research subjects significantly compared to that in past ($P<0.05$).

Moreover, Yoyok Febrijanto found out in his studies that majority of the nursing students were not willing to gain writing skills due to their disability at organizing their writing, uncomprehending the relationships between the subjects as well as their weakness at memorizing vocabularies and understanding writing mechanism. In this study, writing was taught using Mind Map technique. Due to the fact that applying this technique requires students' creativity and activity, Mind Map could make the learning process and the students' participation in the class enjoyable.

In the study conducted by Nemati et al.(Nemati, Jahandar, & Khodabandehlou, 2014) Forty Iranian EFL students in the same level were fallen into the experimental and control groups. Before the intervention, a test was taken from the subjects of two groups to compare their ability at essay writing. During the course, the subjects in the experimental group were taught how to use Mind Map to write an essay. The results showed that the experimental group improved at writing essays compared to the control group.

According to the study of Gomez and King(Betancur & King, 2014), colors and pictures used in Mind Map help our brain to create relationships between the contents presented in a classroom and remember them in future.

Abi-El-Mona and Adb-El-Khalick(Abi-El-Mona & Adb-El-Khalick, 2008) investigated the effect of Mind Map as a learning tool on the scientific success of a group of students in the eighth grade (62 people). The subjects of the experimental group created Mind Map and those in the control group took notes. The results showed that the experimental group got significantly higher scores compared to the control group.

In another study conducted by Piri Ardakaniin 2015, Iranian high school students learning English conversation and writing in an English institute in Tehran were the subjects. The subjects were categorized into an experimental and a control group; in each group, 35 subjects. The subjects in the experimental group were taught based on the

Mind Map technique and their average score was 24.60 which were significantly higher than the average score in the control group (12.93). The results of this study showed a significant difference between the scores of two groups (P<0.001)(Ardakani & Lashkarian, 2015).

In the study of Kim and Kim(Kim & Kim, 2012), the educational implications of using Mind Map software were investigated. This study showed that using this technique had positive effects on memorizing the words in elementary levels and they introduced Mind Map as a suitable tool for educational goals.

Moreover, Benavides et al.(Benavides, Verónica, & Rivera, 2010) Emphasized the positive role of Mind Map software in summarizing and organizing.

Conclusion

This technique provides a suitable situation for students to participate actively in their learning process especially in non-communicable disease such as cancer, Cardiovascular disease and Diabetic Disease. Not only using Mind Mapping technique can help students to receive the material and content but also it can help them to analyze and organize them efficiently.

Mind-Mapping technique has many advantageous; however, it needs to spend plenty of time and energy to be master at it like any other new techniques. Moreover, some students accept it very hard(Hofland, 2007) . On the other hand, forcing students to draw pictures and use photos or colors may be the reason of their dissatisfaction(Fiktorius, 2013).

Declaration

- Consent for publication:

- All authors of the manuscript have read and agreed to its content and are accountable for all aspects of the accuracy and integrity of the manuscript in accordance with ICMJE criteria
- That the article is original, has not already been published in a journal, and is not currently under consideration by another journal

- Conflict of interests

The authors state that there are no conflicts of interest in this research.

Acknowledgment

This study was result of an educational process under the supervision of deputy of education in Ahvaz Jundishapur University of Medical Science. Authors also need to express gratitude and appreciation for cooperating of all students in this educational process.

Availability of data and materials

The datasets used during the current study are available from the correspond author on reasonable request.

References

Abi-El-Mona, I., & Adb-El-Khalick, F. (2008). The influence of mind mapping on eighth graders' science achievement. *School Science and mathematics, 108*(7), 298-312.

Al-Jarf, R. (2011). Teaching spelling skills with a mind-mapping software. *Asian EFL Journal Professional Teaching Articles, 53*(4).

Ardakani, M. P., & Lashkarian, A. (2015). Usıng Mınd Mappıng Strategy to Improve Readıng Comprehensıon Abılıty to Intermedıate Iranıan Student. *Cumhuriyet Üniversitesi Fen-Edebiyat Fakültesi Fen Bilimleri Dergisi, 36*(3), 1077-1095.

Benavides, S., Verónica, F., & Rivera, R. (2010). Improving Reading Comprehension Skills by Using Mind Mapping Software with Students of Bachelor's Degree in English Attending Reading and Writing in English II Course at Universidad de Oriente UNIVO, San Miguel. *Unpublished doctoral dissertation). Universidad de Oriente, San Miguel, El Salvador*.

Betancur, M. I. G., & King, G. (2014). Using mind mapping as a method to help ESL/EFL students connect vocabulary and concepts in different contexts. *Revista Trilogía, 6*(10), 69-85.

Buzan, T. (2006). *The Buzan study skills handbook*: Pearson Education.

Buzan, T. B., Barry. (1993). *The mind map book*. New York.

Fiktorius, T. (2013). The use of mind-mapping technique in the EFL classroom: A critique and demonstration of methods. *Unpublished Master Dissertation, Teacher Training and Education Faculty, University of Tanjungpura, Pontianak, Indonesia*.

Hofland, C. (2007). Mind-mapping in the EFL classroom. *Fontys Hogescholen: Fontys Teacher Training College Sittard*.

Kim, S., & Kim, M. (2012). Kolb's learning styles and educational outcome: Using digital mind map as a study tool in elementary English class. *International Journal for Educational Media and Technology, 6*(1), 4-13.

Nemati, A., Jahandar, S., & Khodabandehlou, M. (2014). The effect of mind mapping technique on the enhancement of advanced Iranian EFL learners' essay writing ability through organizing information and thoughts. *Indian Journal of Fundamental and Applied Life Sciences, 4*(1), 96-104.

Tungprapa, T. (2015). Effect of using the electronic mind map in the educational research methodology course for Master-degree students in the faculty of education. *International Journal of Information and Education Technology, 5*(11), 803.

Zipp, G. P., Maher, C., & D'Antoni, A. V. (2009). Mind Maps: Useful schematic tool for organizing and integrating concepts of complex patient care in the clinic and classroom. *Journal of College Teaching & Learning (TLC), 6*(2).