Chapter 38

Computer-Assisted Mind Mapping Technique for Reading Comprehension in Technical English for ESL Students

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ABSTRACT
Reading comprehension has always been regarded as one of the essential aspects of language learning. It is purposeful and requires active involvement on behalf of the readers, as during reading a text, they have different aims to achieve (Koda, 2005). ESL students still face difficulties to engage with the text, and make meanings and links from it. Mind mapping, a thinking tool in form of graphic and visual presentation of materials, was first introduced by Tony Buzan in the late 19th century. Mind mapping increases students’ ability to actively engage with the reading passage by connecting concepts and meanings more efficiently than other methods. Computer-assisted mind mapping is done with various software such as iMindMap. The aim of this study is to examine the impact of computer-assisted mind mapping on reading comprehension on for the subject Technical English for ESL students. The research question is - what is the effect of the computer-assisted mind mapping learning strategy on ESL students’ reading comprehension? 50 students taking engineering and technology courses at foundation level in a higher education institute, consisting of two classes with similar language proficiency participated as the subjects. Only one class will be introduced to computer-assisted mind-maps based on reading passages. All participants sat through a pretest and posttest and the results were compared between the control and experimental group. The experimental group was also asked of their opinion on using mind-mapping in reading comprehension. Results indicated that the group doing computer-assisted mind maps scored better than the control group and enjoyed a positive learning experience.

Key Words: Mind-mapping, reading comprehension, computer-assisted mind-mapping, ESL, iMindMap
1. INTRODUCTION

Reading comprehension has always been regarded as one of the essential aspects of language learning. It is purposeful and requires active involvement on behalf of the readers, as during reading a text, they have different aims to achieve (Koda, 2005). Adewole (2001) describes critical reading skill, which students need to read, explore, and appreciate a literary text effectively. Oyerokun (1993) emphasizes the need to use appropriate techniques and materials in teaching. The ability to read is a crucial skill for information retrieval thus, generally, the development of reading comprehension skills is essential for success in academic achievement.

In a private engineering and technology tertiary level institute, students are targeted and expected to be proficient in English, thus master reading comprehension of various types of texts, especially in this context, technical English texts. However, it is commonly observed that most students are reluctant to read materials beyond their academic requirements. Lack of extensive reading leads to lack of vocabulary mastery which also limits their effort to achieve reading comprehension. Technical English is taught in this institute where students learn English in science and technology context, in order to prepare them as English-proficient workers in the technology industry in the future.

Tony Buzan, the mind map inventor who is a brain researcher, claims that mind map is a vastly superior note taking method because it does not lead to the alleged "semi-hypnotic trance" state induced by the other note forms. There are research evidences that knowledge stored in the brain is hierarchical, i.e. organized in levels. Mind maps represent knowledge in the same way the brain stores it; which is why they are so intuitive and effective.

Previously, concept maps were done manually, but developmentally in this digital era, special software started to be used for computerizing concept mapping. Computerized concept mapping is more professional and eye-catching. Moving from pen and paper concept maps to Computer-Assisted Mind Maps (CAMM) holds potential benefits for students and educators alike, bypassing many limitations of traditional paper methods. Specific disadvantages of paper maps are space constraints, permanency and limited ability for sharing or collaboration. In contrast, CAMM are flexible, less constrained, and readily amenable to both sharing and collaboration.

The aim of this study is to investigate the impact of computer-assisted mind mapping on reading comprehension on for the subject Technical English for ESL students. The research question is - what is the effect of the computer-assisted mind mapping learning strategy on ESL students’ reading comprehension?

2. LITERATURE REVIEW

There are many names used for mind maps, such as concept maps, semantic mapping, knowledge mapping, think-links, graphic organizers or cognitive maps (Svantesson, 1989). In this paper, the term ‘mind map’ is used. Buzan (1993) describes mind maps as
a representation of cognition and comprehension in the learner, and as an excellent way to help learners to express themselves both verbally and visually. Indeed, in their mind map, learners may use graphic representation which may help in the brainstorming process. The use of mind 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).

Scores of studies have been made on the application of mind mapping on learning various subjects including English. According to Siriphanich and Laohawiriyanon (2010), besides investigating the effect of mind maps on reading comprehension of Thai EFL learners, they also examined their attitudes towards using mind maps in reading comprehension. Their attitudes were evaluated via a questionnaire and interview. The questionnaire was distributed among all the students but the students who were interviewed were in three groups: those who got higher scores in using mind maps, those who got lower scores, and those whose scores had no change in spite of using mind maps. The results of questionnaire showed that most of the students (72.4%) were satisfied with using mind maps while reading for better comprehension. The results of interview showed that the students who got the higher scores did not have any problem in using mind mapping technique in their reading comprehension.

Benavides et al. (2010) conducted a study on the effects of mind mapping software on reading comprehension for the students of Bachelor degree in English attending reading and writing in English II course at Universidad de Oriente Univo, San Miguel. In this research, the attitudes of learners towards using mind mapping software were investigated, too. The results of questionnaire showed that 100% of the students considered the Mind Mapping Software as a useful tool for the improvement of reading comprehension skills and summarizing reading materials and 80% of the students believed that it fosters reading and writing skills. In this study, 88% of the students answered that this technique helped them visualize the readings.

3. METHODOLOGY

The study is a semi-experimental investigation in which the researcher employed a pre-test, post-test control group design. 50 students taking engineering and technology courses at foundation level in a higher education institute, consisting of two classes with similar language proficiency participated as the subjects. This study was implemented in two classes over a period of three weeks. The instruments used in this study were online mind-mapping software named iMindMap, pre-test and post-test of reading comprehension, and feedback survey which was given afterwards. The iMindMap instruction was given in class and the students did the mind maps in their mobile devices.

4. RESULTS & DISCUSSION

The findings in the result comparison between the reading comprehension tests between the two groups of classes indicate that the group doing mind mapping scored better.
Evidence that the learners who received mind mapping instruction did significantly better on the post-test suggests that mind mapping technique was effective in leading learners to comprehend technical texts better. This suggests that mind mapping technique was effective for students doing reading comprehension activities in technical texts, which is parallel to other studies conducted in the past. The students’ reactions to the mind mapping to comprehend the texts were categorized as good. In the questionnaire, feedbacks received indicated that majority of the students enjoyed the application of mind maps since it involved drawing and using many colours, in addition to the software application being user-friendly.

University students currently use various digital media applications in everyday lives for their learning and smart applications like iMIndMap should be effortlessly incorporated into their classroom experience. With this software for computerized mind mapping, students can be able to visualize the entire reading text content remarkably. Undeniably there are constraints such as students not having sufficient battery to draw the mind maps in their mobile devices brought to class. However, the benefits of computer-assisted mind maps outweigh the potential drawbacks significantly.

5. CONCLUSION & RECOMMENDATION

The findings clearly demonstrate that mind mapping may serve as a useful graphic strategy for improving reading comprehension. Students processed the technical reading texts faster with mind maps and thoroughly enjoyed employing mind maps in learning. It is recommended that the educators use more mind mapping in teaching and classroom activities. This technique can also be applied for other subjects where students face difficulties comprehending their reading materials.

REFERENCES


