

CONCEPT MAP: A STRATEGY FOR ENHANCING READING COMPREHENSION IN ENGLISH AS L2

*Reinildes Dias – Federal University of Minas Gerais
reinildes@gmail.com*

Abstract. This article reports on an action-research that was born out of the need to develop students competence to read academic texts related to their field of study. Concept maps were chosen as a strategy to empower students to be more effective readers and knowledge creators (Novak, 2010; Novak & Cañas, 2008). Students were made aware of the importance of visually displaying information from a text to facilitate interpretation in English as L2. For this purpose, they learnt what a concept map is, its main features and its usefulness for displaying a web of concepts and their relationships on a single surface to aid both general and in-depth comprehension. They also learnt how to create them by using the software Cmap Tools available for free download at <http://cmap.ihmc.us/download/>. Results showed that the construction of meaning by the creation of concept maps can be an effective reading strategy in English as an L2.

1 Introduction

Applied linguistics has been widely recognized as an area of study (research) and practice (application) within the broad field of linguistics. It may be primarily concerned with the solution of educational problems related to the acquisition and learning of an L2. In one of their roles, applied linguists may engage with the development of practical classroom research based on the concurrent use of theory and methodological approaches coming from different fields of study such as education, communication, language, digital technologies, among others. The results obtained may turn into sound foundations for the creation of teaching materials as well as for the understanding of how learning can be enhanced. The research described in this article is an attempt to provide an optimal solution to an education problem in a class of Brazilian undergraduates, more specifically, the use of concept maps to represent text information students need to read for comprehension in English. The software *Cmap tools* (<http://cmap.ihmc.us/download/>) was used to create mapped representations of what they understood or learnt from a text. This software empowered the group of students to reconstruct the meaning of academic texts they read and to share and discuss what they had done with other peers.

The notion of concept map underlying this research is that it is a way of displaying major concepts (from a text or lecture) and the relationships or links between them in a visual arrangement. Most often, the concepts are hierarchically plotted on a computer screen with the most general encompassing the more specific with relationships or links between them shown in space by the use of lines (or arrows). Linking words (such as, is an example of, causes, enables and so forth) are written on these lines to facilitate the task of generating propositional statements (Naidu, 1991; Novak & Cañas, 2008). When created with the use of the free software mentioned above, additional information can be added in a hypertext mode and links can be made to different URL addresses, for example, or to other documents previously prepared to be inserted into the concept map and even to other kinds of media as audio files, images, videos, animations and so forth.

The main purpose of this article is to discuss the procedures of an action-research (Burns, 1999) conducted with a group of Brazilian undergraduates who were learning how to read in English more effectively. First, I will briefly discuss the notion of concept map and present the characteristics of the software Cmap tools. Then, the research design will be discussed, followed by a description of the context, including the subjects who participated in the study. I will then discuss the results obtained.

2 Concept maps

This strategy has been extensively investigated in a variety of contexts which include reading comprehension for the recall of information, writing skills, science education, and testing, with different age groups ranging from elementary to graduate students, especially in the L1 context though some research has also been conducted related to the enhancement of reading comprehension in L2 (Dias, 1998). Previous research has revealed that one of the difficulties

in implementing concept mapping as a reading comprehension strategy is the difficulty in convincing learners to make use of a learning tool with which they are not familiar (Naidu, 1991). Another point is that it seems that map drawing is a time-consuming task that involves a lot of effort on the part of the “mappers” and this may discourage learners from integrating it into their study habits (Naidu, 1991). However, the present research shows that students can get interested in mapping the texts once they become aware of its usefulness for the enhancement of text comprehension in English, after having learnt how to create them more effectively with the *Cmap* software.

A key notion in mapping information from a text is that of creating propositions that involves the linkage of two or more concepts with the use of “linking words or phrases to form a meaningful statement” (Novak & Cañas, 2008). Various meaningful statements can be read from a concept map about any major concept that has been mapped.

Another essential feature is that concept maps can become hypermedia documents when links are created to different types of media as, for example, to videos, animations, audio information. Concept maps can thus become a multimodal learning environment that will allow learners learn from the different representations provided by the specific features of each type of medium. For instance, learners can learn more about the history of cinema throughout time from a map that contains links to trailers of films, interviews with directors and staff, movie posters, thus adding hypermedia information to the graphic organization of the events hierarchically displayed on the digital screen.

3 Cmap Tools

This is a software suite that facilitates the individual and/or collaborative construction of knowledge models represented as concept maps. It can empower learners to create propositions linked by specific linkage words to show textual relationships more effectively as well as to aid in the process of creating concept maps as multimodal environments. This software also offers a style palette thus allowing mappers to shape their maps with colors, shadows, background images, different types of lines and arrowheads for indicating directions, different types of sizes and fonts, and text alignments. The auto-format feature is another essential means as it can automatically position concepts relative to each other so as to create a well-proportioned map. Concept maps can be exported in a wide variety of formats: as an image, a web page, or as a LifeMap, for example. *Cmap tools* can also facilitate the publication of mapped information for discussions and feedback with others. Besides, its collaboration features are very powerful, allowing users to search across a large repository of concept maps as well as to join a “soup” which is a shared bank of concept maps that can be retrieved for download and use. This software can be downloaded for free at <http://cmap.ihmc.us/download/>. Numerous examples of concept maps created that have been created using the *Cmap* software can be found at <http://www.cmappers.net/>.

4 Research Design

Typically, action research is undertaken in academic / school settings (Burns, 1999) and one of its prime focus can be on learning in a social context. From this perspective, this type of research is mainly influenced by John Dewey’s work (1933) which is still influential in the context of education. Action research is a reflective process that allows for inquiry and discussion as components of the “research.” Rather than dealing with the theoretical, action research allows teachers and students (co-participants) to address those concerns that demand attention in a specific learning situation as, for example, the development of strategies to improve reading comprehension in English. As such, this type of research does not start from a view of educational problems as pathologies. Rather, it is motivated by a quest to understand how learning occurs in a particular classroom setting and how to improve it to effect positive changes concerning a specific learning goal to be attained. Teachers and students are co-participants in writing their own narratives by knowing what they are doing to develop ways to improve learning. In short, action research is concerned with changing situations, specially in classroom settings and not with simply interpreting obtained results based on collected data. Both teachers (researchers) and students (co-researchers) engage into a systematically-evolving process of change that can lead to better understand of how learning occurs that will reflect on better ways to learn by means of collaboration among participants. Action research allows for the use of different instruments for collecting and analyzing data within the qualitative research paradigm. These instruments may include, among others, narrative journals, document collection and analysis, participant observation recordings, questionnaire surveys, structured and unstructured interviews, and case studies.

The present research was undertaken based on the need to enhance Brazilian undergraduates reading comprehension of texts written in English. I was particularly interested in figuring out ways of *scaffolding* students (Vygotsky, 2003) throughout this challenging process, making them aware that conscious use of reading strategies can help them become successful readers. Students' goals, on the other hand, were related to their need to learn how to read texts concerned with their field of knowledge that were written in English. The setting was a classroom at the Language College at the Federal University of Minas Gerais in Belo Horizonte. The subjects were eight students from different fields of study (engineering, social studies and language) that were taking the discipline "ESP for reading" and the researcher was myself as the teacher of the group. These students could be classified as "false beginners", that is, they had already developed some grammar and vocabulary competence, but could not deal with a longer piece of writing, even those that were related to their own fields of specialty.

To undergo the action research presented in this paper I followed four main phases: (1) planning the action; (2) acting towards the research goals (together with my students), (3) assessment of the maps created by them and (4) reflecting about the process we were going through. In phase one, I set up the main objective of our action in the classroom which was to enhance reading comprehension in English as L2 by the drawing of concept maps of the texts they read. I chose the *Cmap tools* (<http://cmap.ihmc.us/download/>) as the means by which students would create new representations in a visual format of what they read for comprehension.

My primary objective in phase two was to let students understand that, while creating a visual representation of what they read, they could relate the arguments and ideas discussed in the text more effectively. They downloaded the *Cmap* software into the lab computers and into their own at home. They took the tutorial provided at <http://cmap.ihmc.us/Support/Help/> and collaborated with each other during the process of learning how to use this tool through forums, e-mails and in class when they were with me. They acquired knowledge and developed skills concerning the *Cmap tools* in the process of creating their maps using the texts they had to read for the other disciplines of their curriculum. Each participant made at least three maps during the semester. They were stored in a visual space and we held discussions about the represented texts. It is worth pointing out that the texts students read were chosen by them and they were related to their own field of specialty. In this way, different texts and maps were read and created. As far as the task of map creation is concerned, students were suggested to follow Dias' s (1998) guidelines about how to build a concept map.

Phase three of the present research corresponded to my assessment of what students created based on the texts they read. In the last phase, students were asked to write brief narratives¹ (short reports) about their experience with creating concept maps for better reading comprehension. They could write them whenever they wanted to and their reports were posted on our interaction forum. Some of them wrote more than two reports.

Data was collected through the following instruments: (1) storage of the maps created by the students in a virtual space; (2) assessment of the quality of the maps by me (that is, how much the created maps reflected an understanding of what was read). The assessment criteria involved three words of appraisal: fair – good – very good; and (3) narratives that were written by them about their experience with developing a specific visual strategy to enhance reading comprehension in English.

5 A brief discussion of the results

The storage of the maps in a virtual space enabled us to hold debates about what the students had been reading and mapping throughout the semester. As there were different maps based on different texts related to different fields of knowledge, the student responsible for each specific map under discussion assumed a leading role in conducting the discussions. All group was actively involved in asking questions and trying to understand what had been mapped by the colleagues. The engineering students, however, were not much interested in the texts that were chosen by the language students but, though not actively involved as the others, they had their say in the debates.

My assessment of the concept maps revealed that students not only learnt how to create the maps by using the *Cmap tools*, but also enhanced their comprehension of texts in English due to the new representations that were

¹ Narratives in this context means the short accounts written by the students - they reflect their impressions and feelings about mapping the change this strategy effected in their comprehension in English.

visually displayed in the concept maps. There was also an increase in the quality of the maps created by the students – in my viewpoint this was an indication that they were reading texts more thoroughly. As concept maps are Figures of the understanding of something, I could see how much the students comprehended the texts they mapped. It is also worth remarking that all the group got involved with the task of map creation and demonstrated that they really enjoyed creating them. It is possible to say that they grasped the usefulness of this task for better reading comprehension. All participants remarked that they were using the strategy for studying for other subjects of the curriculum and that they would go on using it.

The students' own narratives revealed the positive impact the process of map drawing had on their awareness of the reading process and how they managed to have more control over reading comprehension in English by visually representing what was conveyed in the texts they read.

In fact, what I noticed throughout the semester is that creating a visual representation of a text can enable students to follow how authors organize and bring together their arguments around a specific topic in the texts they write. These texts may take the form of different genres – they can come out as academic, scientific or news articles, reports, interviews, critical reviews and so forth. For instance, a concept map of the online scientific article Alternative fuel vehicle (http://www.sciencedaily.com/articles/a/alternative_fuel_vehicle.htm), mapped by one of my students, graphically showed the world's need for this type of vehicle, the argumentative support to this urgent necessity, what an alternative fuel vehicle means, how it can be developed, its effects on the environment, what has been done thus far for its development, agencies and governments that have been involved in the quest for this type of vehicle etc. As the mapped graph is a visual representation of the textual format, it can be more easily understood and what is learnt from it can be retained and recovered more easily too. Furthermore, if the maps are created with the software Cmap tools, links can be attached to the map and this will add information – even from different types of media – that can be accessed (and/or reviewed, rewritten, added, deleted) at any time. Another additional advantage is that the map can be shared with others and collaboration is at hand to improve the quality of the material that has been graphically displayed. Debates can be held about the information they display both synchronously or asynchronously.

6 Concluding Remarks

Though I had a small number of participants, this action research gives me evidence to point out that the creation of concept maps for enhancing comprehension in English as L2 can empower students in two important ways. First, in the development of their autonomy concerning ways to organize knowledge acquired from texts and, secondly, in their awareness that they can read well in English for academic purposes once they use adequate strategies. As the main purpose of a concept map is to represent (on a single visual plane) a person's mental model of a concept, the students can get more control over what they read for comprehension. Therefore, it may be possible to say they will become more effective learners and knowledge creators, capable of reading texts from their field of specialties fluently. As mentioned in the foreword to Novak's (2010) latest publication "the central purpose of education is to empower learners to take charge of their own meaning making". Visual representations such as concept maps will enable them to do so.

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