The Effects of Electronic Concept Mapping Software on Fifth Grade Students’ Writing

Rachel Karchmer-Klein, PhD
Charles MacArthur, PhD
Kristina Najera
University of Delaware

Concept maps are visual representations of relationships among different ideas. Several researchers have found the use of concept maps, or similar graphic organizers, to be associated with increased learning in content areas (Chularut & DeBacker, 2004; Nesbit & Adesope, 2006). Concept maps are widely used in writing instruction and are an important component of some writing strategies that have been shown to be effective (Graham, 2006).

Most concept maps are developed with paper and pencil. However, electronic concept mapping, generated by software such as Inspiration, has become widely used as technology access in schools increases. Electronic concept mapping offers many advantages over mapping with paper and pencil (Anderson-Inman & Zeitz, 1994). One advantage is the malleability of the electronic version. Students can repeatedly update and revise the map, inserting new ideas and concepts in their appropriate location. Another advantage is that students can be provided with templates representing various text structures or genres. A third advantage is that the software can automatically translate the content of the concept map into an outline or rough draft, organized in the same way as the map.

Electronic concept mapping for writing has been studied with students with LD (Sturm & Rankin-Erickson, 2002), and some descriptive research has focused on the use of electronic mapping to support reading and writing skills (Anderson-Inman & Horney, 1997; Anderson-Inman & Zeitz, 1994). However, prior to the current study, there were no empirical studies investigating the effects of electronic concept mapping for writing in typical classroom settings.

Our study examined the effects of electronic concept mapping on fifth-grade students’ writing using a template, created with Inspiration software, representing a compare/contrast text structure. Furthermore, it investigated the effects of automatic translation of the concept map into an outline and rough draft of the essay. In addition to investigating the immediate effects of using concept mapping software to plan an essay, the study tested whether students learned something about planning that transferred to writing without use of technology. In all experimental conditions, students wrote using word processors to avoid confounds due to motivational effects of computer use.

Procedures

In this study, Inspiration software was used to generate concept maps prior to writing. Fifty-seven 5th grade students who had experience writing with word processing software used a template for
compare/contrast text developed by the researchers. Inspiration also provided the capability of automatically translating the concept map into an outline within Inspiration and a rough draft in a word processor.

The study required a total of eight 45-minute sessions. The first session included an explanation of the compare/contrast essay genre and the collection of a pre-test essay via handwriting. In the second session, students in the concept mapping (CM) and concept mapping plus transfer (CMT) conditions learned to use the concept mapping software, and students in the word processing only (WP) group practiced brainstorming. In the CMT condition, after students constructed a concept map, they learned how to transfer the content to an outline, where they made revisions. After making revisions in the outline, students were instructed to use Inspiration’s transfer function to transfer the outline’s contents to a rough draft, which offered an opportunity to revise and edit their essays before submitting as a final draft.

In the third session, the teacher explained the text structure for a compare/contrast essay using a sample essay, and modeled the process of planning an essay following the assigned conditions. In the fourth and fifth sessions, students practiced planning and writing an essay with support from the teacher. In the sixth and seventh sessions, students worked independently to plan and write an essay on an assigned prompt using the computer in their assigned conditions; this essay was scored as the posttest. In the eighth session, students wrote an essay via handwriting; this essay was scored as the transfer essay.

Results

Results of the study revealed that both the CM and CMT groups outperformed students in the WP group on their ability to include more compare/contrast text structure elements in the posttest essay written with computer support. This result indicates that planning an essay on the computer using an electronic concept map helps students write compare/contrast essays that include more text structure elements than students who did not use a concept map to plan their writing. Though the differences between groups were not significant on measures of writing quality and length, the final writing quality scores did show improvement over the pretest scores indicating that the quality of the writing improved with the help of electronic concept mapping.

Observation of students during the planning and writing process revealed that students who planned with an electronic concept map appeared more focused and were more likely to add relevant information and make connections between ideas than the WP group. However, once students in the CMT group transferred the contents of the concept map to an outline, they engaged in very little revision. They used this function to edit and format their papers. Students in the WP group, who planned their essays by brainstorming and recording ideas on a word processing document, appeared less focused and lost interest in the activity very quickly. Many students in this group recorded information quickly then spent the remainder of the time changing the font and adding pictures and designs to their papers.
This study has important implications for the use of concept mapping software as part of the prewriting and drafting process during classroom writing instruction. The results provide evidence that electronic concept mapping can influence students’ incorporation of structural elements of compare contrast essays, demonstrating that the software can help students plan and write better essays. This is particularly important for students who do not spend much time on the planning process before writing.

Though this study yielded positive results, we are left with a few questions which require further consideration. One question refers to the type of template used to teach the genre: how do you develop a template that best fits the genre you are teaching? For the current study, we designed our own template rather than choosing one of the many offered by Inspiration because we wanted something that was simple and more closely related to the instruction we designed for the study. However, the templates offered by Inspiration may have been adequate for our needs. Perhaps the choice of a template depends on the genre one is teaching, on the students’ background knowledge, or on the type of instruction for a particular writing assignment.

A second question considers the issue of time management: is the time involved in teaching students how to use this software is time well-spent? Does it help meet the goal of effective writing instruction? Schools have technology standards that must be met. Inspiration is a way to meet some of those standards by including this type of software as part of the planning process. However, it would be helpful to know how to seamlessly incorporate this software into a packed instructional routine.

A final question refers to revision, one of the most difficult parts of the writing process: is Inspiration an effective format for teaching students how to revise their essays? Though we didn’t spend much instructional time on revising using Inspiration, it might be worth a deeper look considering the difficulties students have with revision.
References


