Computer Supported Concept Maps: Excellent Tools for Enhancing Library Workshop Presentations

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Abstract:

Computer supported concept maps are very effective visual aids for library instructional workshops. These visual aids help presenters meet the common workshop challenges of time constraint and diverse audience groups. Concept maps themselves represent information in a simple way, allowing audiences to visualize concepts and their inter-relationships quickly without lengthy textual explanations. When these maps are enhanced by the special features of computer software, they can be presented in a smoothly transiting sequence. In addition, these computerized maps can be randomly accessed so that a particular map can be displayed out of the scheduled sequence if the situation requires. Finally, all computerized maps can be installed locally on the current instructional workstation, consequently helping to reduce some risks of disruptions during presentation.

Introduction

The rapid advancement in the information world (e.g. development of the WWW) creates greater necessity to assist library patrons in learning new information access skills. In

addition, the "increased reliance on electronic tool impacts what library users need to learn, how they can be taught." (Byron 1995) This requirement places more emphasis on continuing the existing role of librarians as educators. An exploratory study conducted by Heather Morrison, using focus group methodology, shows that students appreciate instruction for library research skills and the supportive reference services their library offers. She recommends libraries continue providing these two crucial services. (Morrison 1997) Supportive reference is primarily a one-on-one interaction between librarian and patron, while bibliographic instruction can be conducted either individually or through workshops. Bibliographic workshops reach more patrons but also burden presenters with challenges which originate in the characteristics of workshops and participants. These challenges include time constraints and diverse audience groups. Unlike academic classes, the workshop presenters and the participants will only have a few hours' contact, compared to a full academic semester or quarter. That means that the presenters need to communicate the workshop's concepts clearly and precisely in a relatively short time. This time constraint factor is further complicated by the minimal restrictions on registration, which result in academically and technologically diverse audience groups.

This paper explores the prospect of concept mapping in facilitating the presentation of library research instruction workshops. It then extends this possibility further with the support of computer graphic software, minimizing the two most common disruptive factors in presentations: frozen screens and the need to display materials out of order. As a result, presentations can be more interesting, easier to understand, and completed within the scheduled time frame.

What are concept maps?

Originally developed by Dr. Joseph Novak, concept maps are used as teaching tools and have generated many positive results in the classroom. (Novak 1980, 1981) Concept maps are frequently employed in the classroom because they offer a "complementary alternative to natural language as a means to communicate knowledge." ([Gaines and Shaw 1995](#)) This visual approach has proven to be of great benefit to diverse student groups. Teachers who teach Spanish-speaking students English found that common visual language is very effective in enabling students to transfer their patterns of thinking from Spanish into English. (Heryle 1996) There are three basic features used in creating concept maps: (1) a list of concepts, (2) lines that represent the relational links between these concepts, and (3) labels for these linking relationships. (Lawson) The procedure of concept mapping starts with the generation of a list of concepts through brainstorming. Connecting lines are drawn between these concepts to indicate the flow of inter-relationships. Labels along the connecting lines further explain the inter-relationships between concepts which may result in a knowledge structure. These maps can be refined by many rethinking and redrawing processes as more knowledge is accumulated from a search. (Novak 1995)

How do concept maps facilitate teaching and learning?

Well thought out and well prepared concept maps facilitate both teaching and learning processes. These maps facilitate teaching because teachers can use them to prepare and

organize lessons by sequencing topics within lectures. (Novak 1995) Logical sequencing of topics helps present instructional materials in a more meaningful way. It is proven that "humans are significantly better able to absorb and retain meaningful learning than rote learning." (Willerman 1991) Moreover, during the concept mapping process, teachers will have the opportunity to identify and reduce ambiguities, enabling them to deliver clearer and more coherent explanations to students. For the students, concept mapping gives new meaning to learning as they organize the acquired knowledge in their own way. (Willerman, 1991) This newly acquired knowledge can be linked to existing relevant concepts in the student's own cognitive structures (Ausubel 1963) and be expressed on a single two-dimensional diagram. These well-thought-out diagrams represent information in a simple but clear manner, which allows learners to visualize key concepts and their inter-relationships in a more integral sense in a short time. Enhancing a student's abilities to comprehend workshop materials quickly will help reduce the time constraint problem during presentations. Moreover, concept maps communicate knowledge pictorially instead of using lengthy textual explanations. As research points out, that "mental picture may be providing a framework for organizing and remembering information." (Gambrell and Bales 1987)

Using computer software to amplify concept maps' usefulness in teaching and learning during presentations

Drawing concept maps free-hand enables the flow of ideas on paper at the preparation stage, and is excellent for brainstorming and organizing information. However, free-hand drawings sometimes are not very effective for presentation because they may not be sufficiently legible for the audience. Computerized concept maps can be projected on full size screens and are more legible. In addition, concept maps' function as teaching and learning tools can be amplified by special features of software. Software having good navigation features allows the presenter to randomly access computerized workshop materials (e.g. different concept maps) out of sequence, if the situation requires it. It also allows the presenter to loop back to the current display so that the flow of sequence can be restored. As a result, the presenter can freely use different segments of the presentation materials to enhance one another. The software provides drawing tools for different geometrical shapes (e.g. squares, circles, etc.) and lines so that the finished pictures are clean and neat. It also provides options for different fonts, letter size and color palette to facilitate better visual display effects. In addition, many of these computer software programs are compatible with different workstation platforms and can be installed locally without relying on the network connection during the presentation. Local installation helps reduce the risk of freezing screens, which in turn, minimizes the chance of undesirable disruptions during the presentation. Most importantly, concept maps created by computer graphic software can be converted to a format which is compatible with WWW. For example, concept maps created by the author using the computer software ["Inspiration"](#) are converted to GIF files by another software, "GIFconverter". These converted image files are transferred to WWW, and are later refined into clickable image maps.

Using computer software's special feature to facilitate the application of visual elements and to enhance the presentation of the workshop materials

Good preparation for effective presentations includes carefully designed lesson plans and well-organized workshop materials. Carefully designed lesson plans determine the focus of the workshops, the sequence of topics within the lecture and the time span of the presentation. These lesson plans are excellent guidelines for the presenters themselves, insuring that all workshop materials can be presented within a scheduled time, and in order. However, lesson plans need the support of well-organized presentation materials. These materials should be clear, precise, and most importantly, in the easiest to understand form, in order to maintain workshop participants' attention. These materials can be in different formats (e.g. text, visual diagram etc.). Presentation materials in textual format should be legible, which depends on the size and spacing of lettering. (Hathaway) Visual diagrams such as concept maps should never be misleading (oversimplified) and inter-relationships between concepts should be indicated clearly. Graphic design elements are crucial considerations when preparing visual materials. Successful applications of design elements result in visual diagrams that are pleasing to the eye. These elements include color harmony, balanced spacing of icons or objects in the diagram and the unity of different visual elements (e.g. line, shapes, etc.). The main objective is to produce diagrams that can retain attention without causing fatigue to the eyes and that represent concepts and ideas correctly and clearly. (for more detailed information on design elements, Gerald Brommer's *Transparent Water Color: Ideas and Techniques* from which the following is excerpted:

"The elements of design include (the list is different with almost every teacher and every book) line, color, shape, value, texture, space and form. The principles of design include (this list varies even more) balance, rhyme, emphasis, unity, variety, proportion and movement. These principles are concerned with how the art elements relate to each other--- line to line, shape to line, and so on. What we are really concerned about is this relationship of parts. These parts must work together and be satisfying--- then the design will be good."

Computer software-supported concept maps are excellent tools to facilitate the preparation of lesson plans and presentation materials because all segments can be randomly accessed. Due to the computer software's special features, size and spacing of lettering can be adjusted so that textual information can be presented legibly. These features also enable the presenter to arrange lines, shapes and color in visual diagrams to achieve harmonious effects, provided that all concepts and ideas are correctly represented. Most of all, good preparation helps to reduce stress before and during presentation. It also help presenters clarify concept ambiguity and present materials more easily.

Desirable outcome of using computer supported concept maps

When concept maps are supported by computer software, they can help ease two of the most common disruptions during presentations. The two are frozen screens and the need to present materials out of the scheduled sequence. Frozen screens need rebooting which interrupts the presentation sequence and requires additional time beyond the scheduled limit. The need to use out-of-sequence material to give a fuller explanation of a particular concept is very common. The important point is that the presenter needs to be able to reestablish the scheduled display sequence as soon as possible. Time spent on rebooting and locating out of sequence materials will definitely lose participants' attention and undermine the presenter's credibility.

Fortunately, computer supported concept maps can be presented locally, requiring significantly less storage space and not relying on the network connection. This reduces the chance for frozen screens. Computer software with good navigation tools allows the presenter randomly to access any segment of presentation materials. This random access drastically reduces time needed to loop back to the current display. As a result, these computer-supported concept maps contribute to: (1) maintaining an on-schedule presentation, (2) decreasing disruptions, and (3) facilitating learning in a limited time frame.

Conclusion

It requires more than technical knowledge to teach students to retrieve useful information that is meaningful to their research. Librarians' professional training equips them with end users' technological competencies, and the knowledge to acquire information from various resources. Naturally, library professionals are responsible for teaching students library research skills in this fast-paced information age. Librarians need to teach students more than just retrieving information from various sources. The increasing reliance on electronic tools greatly impacts what library users need to learn and how they can be taught. (Bryon 1995) Librarians need to teach students the skills of critical thinking, focusing on relevant needs and discerning useful from irrelevant information ([Jones, 1996](#)) Moreover, they need to teach students how to organize the retrieved documents and data. As a result, students can see the inter-relationship between the retrieved information and be able to link it to their existing knowledge structure (Novak 1995), so that this new information will become meaningful. However, today's information world has changed drastically from a decade ago. In addition to teaching library research skills, bibliographic instruction librarians are also burdened with "the worry of equipment compatibility, telecommunications connections, and reliable internet sites." (Bryon 1995) This paper suggests using computer-supported concept mapping to facilitate teaching library research skills because of its visual representation and organizational capability. Therefore, the complex elements of critical thinking, information evaluation and organization of results can be represented in a visual manner. If planned carefully, this tool can help librarians to deliver an interesting visual presentation, a more easily understood lecture, and an on-schedule workshop.

Appendix

A computer tool for preparing concept maps, [Inspiration](#)

Concept maps are used to organize the major focus of this paper, "Computer Supported Concept Maps: Excellent Tools for Enhancing Library Workshop Presentations."

Sample maps are shown below. They were drawn in free hand originally for organizing information collected and for planning the logic of this paper.

Maps shown here are prepared by the software "Inspiration".

[1. Logistic of this paper](#)

This map consolidates a few free-hand drawings during the brainstorming stage and what argument or logic this paper follows. This map shows that librarians need to be educators due to technology advancement, but presentations are often complicated by workshop characteristics such as time constraints and diverse audience groups. By including concept mapping techniques, presenters can organize and present concepts in visual manner instead of lengthy text. In addition, learners can retain and learn the information easier. The logic of using computer software to support concept mapping presentation is to take advantage of the visual effects and navigation option these programs offer. The desirable outcome is anticipated.

[2. How do concept maps facilitate learning and teaching?](#)

[3. Workshop Characteristics](#)

This map identifies the common workshop challenges presenters need to be aware of. It suggests using computer-supported concept maps to solve the problem.

[4. Introduction](#)

This map presents a visual outline of the introductory paragraph.

[5. Visualizing Your Thinking](#) --- An example of workshop presentation

This is a clickable map. Learners can click on any of these options on the diagram:

clarify specific objectives, state different perspectives, collect concept/keywords, categorize the keyword/concepts and construct the map.

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