CONCEPT MAPPING AS AN ASSESSMENT TOOL
IN HIGHER EDUCATION ACTIVITIES

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Abstract. Concept mapping can be used as an assessment tool and it can be as flexible as it is needed. The authors propose at least three categories for concept maps used in assessment: maps with open propositions, maps with closed propositions, and maps with semi-open propositions. In this paper we report the application of the categories proposed through the use of concept maps in three activities developed at the University of Costa Rica.

1   Introduction

Due to its flexibility, concept mapping can be used to organize, represent, capture, and share knowledge. Moreover, it can be used as a tool for the evaluation of courses, seminars, and other activities held in higher education. For example, Novak reports he used concept maps to evaluate learning as well as the students' affective responses (1998, 192).

Depending on the purpose of the activity, there are many ways to build a concept map that could be used to assess such activity. We propose at least three possibilities, which are related to the construction of the propositions: open, closed and, semi-open. According to this, we present two concept maps with open and closed propositions, as well as a third option displaying a map with semi-open propositions.

2   Concept map with open propositions

At the closing session of the Second International Conference on Concept Mapping CMC 2006, held in San José, Costa Rica, organized by the University of Costa Rica, the local organizing committee gave attendees a concept map to evaluate the conference (Figure 1). This map presented two open propositions indicating whether CMC 2006 "accomplished" or "needs to improve". Then, there were six blank shapes that the evaluator could fill according to what he or she thought were pros and cons of the activity. At the end of the map, there are blank lines for additional comments.
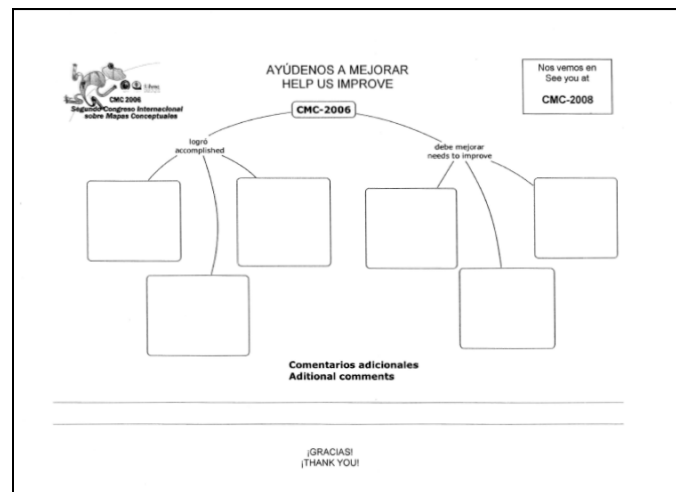

Figure 1. CMC 2006 evaluation concept map. San José, Costa Rica, September, 2006.

The main advantage of using a map with open propositions is the possibility of free communication of ideas and opinions, without the organizers preconceptions. However, this map had a notorious disadvantage, which was the large amount of answers received. At the end, the organizers spent a significant amount of time in classifying the answers and interpreting the results.

3   Concept map with closed propositions

The Vice-presidency of Teaching at the University of Costa Rica opened the Office of Information and Communication Technology supporting Teaching (*Unidad METICS*)[1] in 2006. This office manages the University program of e-learning platforms for students and teachers. The office also advises teachers on improving their teaching skills.

Among its duties, Unidad METICS conducts workshops on using the University virtual classroom involving academic staff. The workshops consider b-learning, virtual learning, planning courses with the support of Information and Communication Technologies, and the use of the University virtual classroom *Mediación Virtual* (http://mediacionvirtual.ucr.ac.cr), among other topics.   Thus, researchers of Unidad METICS produced two maps to assess contents, methodology, organization, and participants' achievement (Figures 2 and 3). These maps are used by teachers participating in the workshops.
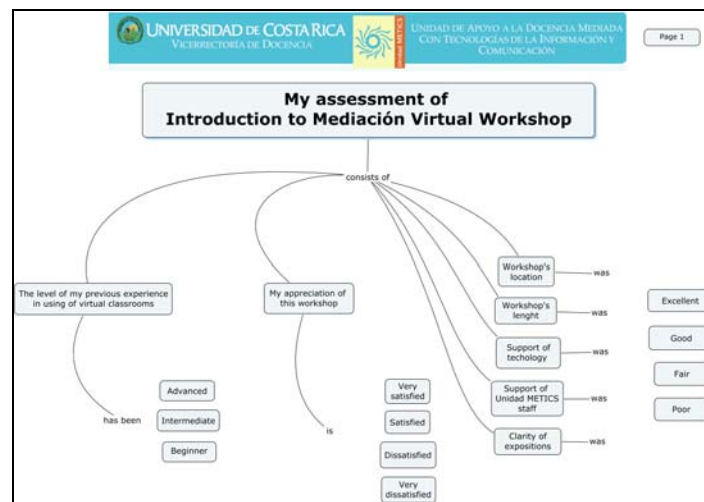

Figure 2. Assessment of Introduction to the *Mediación Virtual* Workshop - Page 1. Adapted from Chacón & Araya, 2008.
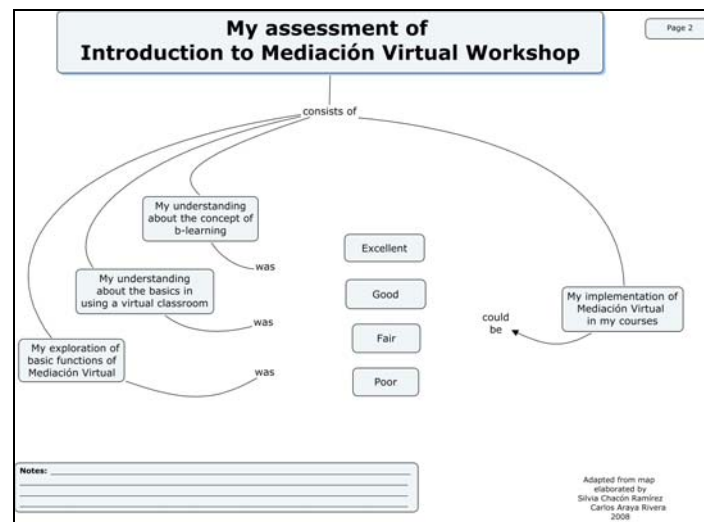

Figure 3. Assessment of Introduction to Mediación Virtual Workshop - Page 2. Adapted from Chacón & Araya, 2008.

Two advantages of these closed-propositions maps are their clarity and usability. A person may easily complete a proposition, by drawing the missing line from the linking phrase to the option better completing the sentence. There is also a place to write additional notes about the activity. However, it may be a disadvantage that the most of the propositions are not quite simple, especially in the first concepts, as it is shown.

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[1] Translated from spanish original name: *Unidad de Apoyo a la Docencia Mediada por Tecnologías de la Información y la Comunicación (Unidad METICS).*

Nevertheless, the purpose of these maps was to assess a very specific activity like a course or a speech, no longer than 3 - 4 hours, and the researchers needed to obtain the participants opinion in such an efficient way.

4   Concept map with semi-open propositions

CONTRASTES is a weekly radio magazine produced by students at the School of Mass Communication Sciences, University of Costa Rica, since 1990. This program is the longest college radio experience en Costa Rica and it is broadcasted on Radio U 101.9 FM, the University student radio station. The program focuses on the information needs of prospective and freshmen students at the University. Consequently, CONTRASTES includes information about University services, undergraduate programs, and interviews, as well as rock and pop music. Every week, the producers attend to a meeting to organize work, evaluate the last program, and confirm details for the program that will be on-air in the present week.

To help students in improving their radio production skills, the program has an academic adviser who is a professor at the School of Communication. As a manner of supporting the participants learning, the professor uses a tool to assess different elements of the production process, specially the program itself. This tool has been mentioned in several publications (Araya Rivera, 2000; 2005) and it is based in the concept of pace. For radio producers, pace is an efficient distribution of the radio language elements and it is defined in two dimensions, internal and external pace. The first reflects the way the research and the writing were made. On the other hand, the external pace reflects the interaction of voice, music, and sound effects in the radio program.

In this paper, the authors adapted the pace assessment tool to a concept map with semi-open propositions, in order to propose an alternative in using concept maps to assess higher education activities. Validation of the proposal is pending (Figures 4 and 5).
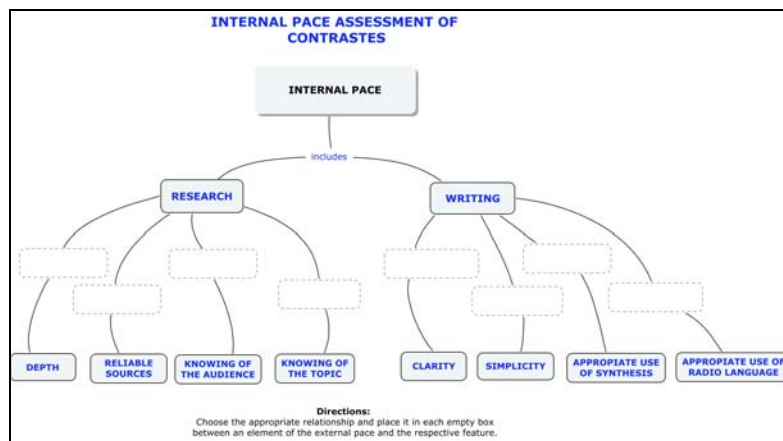

Figure 4. Internal Pace Assessment of CONTRASTES. Translated from Alonso & Araya, 2008.
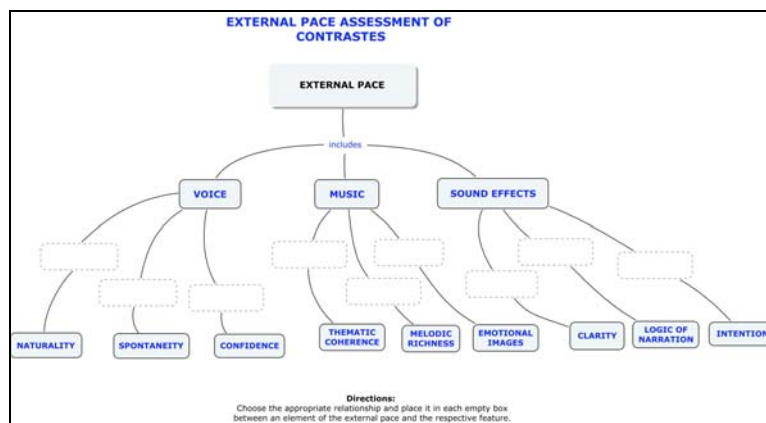

Figure 5. External Pace Assessment of CONTRASTES. Translated from Alonso & Araya, 2008.

The proposed semi-open propositions concept map shows the elements of internal and external pace (Research, Writing, Voice, Music, Sound Effects), then the features of each element, and in between there are empty boxes representing the linking phrases the evaluator has to complete. Although the linking phrase could be the same in all the propositions, these maps are flexible and allow the evaluator to use a different phrase in each sentence (e.g. some alternatives are: *showed, did not show*, *had, had not*). The primary advantage of this proposal is that participants could share and compare their maps to decide the best relationship between concepts.

5   Summary

The application of concept maps in the activities described, show the following:

- The effectiveness of the tool in assessing different kinds of higher education activities.
- The need to adjust and rebuild the assessment maps, considering the topic and the particular characteristics of each activity, as well as the people attending the activity.
- The moment of the application of the tool should be decided according to the higher education activity.
- Concept maps should be clear.
- The target audience should be sensitized with the exposure to the concept map methodology.

Concept maps with open and semi-open propositions are more flexible that those with closed propositions. However, the decision of which concept map should be used, depends on the intention of the evaluator as well as the purpose of the assessment.

6   Acknowledgements

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